The Impact of LiPS Instruction and Teacher Perception on Beginning Readers

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By

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ABSTRACT

The purpose of this study was two-fold. First the researcher set out to determine if phonemic awareness skills improved for first grade students of teachers who used the Lindamood Phoneme Sequencing Program (LiPS; Lindamood & Lindamood, 1998). Second, an attempt was made to determine if there was a relationship between reading improvement in decoding and teacher level variables (i.e., perception of their knowledge of the LiPS program (Lindamood & Lindamood, 1998), and relevant demographic variables).

Students' scores based on the Learning Disabilities Working Committee Kindergarten screening tool (LDWC, 2005) were compared to their respective scores on the Learning Disabilities Working Committee Grade One screening tool (LDWC, 2002). Comparison of progress for all students were evaluated as well as assessment of progress for students deemed at risk (below the 25th percentile) of reading failure compared to those not at risk (above the 25th percentile). Teachers' perceptions of the critical elements of the LiPS program (Lindamood & Lindamood, 1998) and demographic information were collected. The teacher level variables gathered from this survey (i.e., teaching experience, formal training, knowledge, or skill level in program delivery) were correlated to students' scores on the screening tools.

Results revealed that teacher demographics, such as teaching experience, specialized training, and intensity of instructional approach are related to student reading achievement in decoding; however, no clearly defined relationship was found between teachers' perceptions of the LiPS program (Lindamood & Lindamood, 1998) and student achievement. Paired-sample t-tests were also used to determine if statistically significant

differences existed between the means of phonemic identity, phonemic blending, and letter/sound identification between Kindergarten and Grade One. Even though statistically significant results were noted, consideration of the actual change in mean scores and effect size suggested if a practical significance existed. Results indicated that gains were made by students in phonemic awareness and letter/sound correspondence; however, greater gains were noted for students deemed *at-risk* whose teachers used the LiPS program (Lindamood & Lindamood, 1998).

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Finally, without the untiring faith of my best friend and husband, Grant, this dream would not have been possible. Thank you for believing in me, keeping it real, and being my strongest advocate.

DEDICATION

This thesis is dedicated to my parents, Joyce and †Steve.
For with their constant encouragement and prayers,
we were able to take that "one step higher".
God bless you both.

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CHAPTER 1: INTRODUCTION

Reading is a language skill required for individuals to be fully functional and independent (Bursuck, Munk, Nelson, & Curran, 2002; Nelson, Benner, & Gonzalez, 2005; Torgesen, 2000). Educational institutions and other government agencies respond to the need for children to become better readers by investigating, supporting, and adopting instructional practices to improve reading skills at a school level (Carlisle & Hiebert, 2004; NRP; National Reading Panel, 2000; Snow, Burns, & Griffin, 1998; Torgesen et al., 2001).

Stages of early literacy development and recognition of basic skills for reading have been studied and described extensively (Adams, 1990). Formal, direct instruction, recommended to begin in the early years of schooling, can prevent reading difficulties (Coyne, Kame'enui, Simmons, & Harn, 2004). Remediation of reading difficulties is enhanced by early identification efforts that recognize *at-risk* readers (McNamara, Scissons, & Dahlen, 2005). Children considered at risk for reading failure are those whose low levels of achievement are indicated by scores from formal testing procedures (Snow et al., 1998). These *at-risk* readers score below the 20 to 25th percentile, depending on the stringency of the analysis (LDWC; Learning Disabilities Working Committee, 2005).

Phonemic awareness is fundamental to reading skills acquisition and this can be best achieved through systematic instruction (Bowman & Trieman, 2004; Cambourne,

2002; Snow et al., 1998; Torgesen, 2004). One method of systematic instruction that targets phonemic awareness using deliberate teaching methods is the Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech (LiPS; Lindamood & Lindamood, 1998). This program integrates auditory, visual, and language processes (Lindamood & Lindamood, 1998). Given direction on content to be taught and instructional strategies to be used, other influential factors that affect teaching and learning exist. For example, Mather, Bos, and Babur (2001) predicted that teacher perceptions of instructional methods and their own knowledge of language structure impact the reading outcomes of students.

1.1 Statement of Purpose

Early literacy initiatives have been driving forces for education in the last decade (NRP, 2000; Snow et al., 1998). In order for school divisions to support educators' effective practice choices, they have earmarked money, time, personnel, and resources needed for training and support (Saskatchewan Learning, 2006). The LiPS (Lindamood & Lindamood, 1998) program is believed to be an example of an efficient and effective early literacy initiative (Torgesen, Alexander, et al., 1999).

A few research studies on teacher perception as it related to systematic and explicit reading instruction have been documented (Bursuck et al., 2002; Mather et al., 2001). Several research studies that examined the effects of LiPS (Lindamood & Lindamood, 1998) instruction on children's phonemic awareness have yielded differing results on the impact of phonological awareness development and word reading transferability (Pokorni, Worthington, & Jamison, 2004; Torgesen, Alexander, et al., 1999; Torgesen et al., 2001; Truch, 1994). Published research investigating teacher

perceptions of the critical features of the LiPS program (Lindamood & Lindamood, 1998) and the extent of change in children's phonemic awareness is nonexistent. This study set out to address whether the LiPS program (Lindamood & Lindamood, 1998), and the teachers that implement the program, effect change in their students' phonemic awareness skills.

The purpose of this study was to determine: the effectiveness of the LiPS program (Lindamood & Lindamood, 1998) in improving phonemic awareness skills for first grade students; and if there was a relationship between students' reading improvement in decoding and teachers' perceptions of their knowledge of the LiPS program (Lindamood & Lindamood, 1998).

Specifically, this study investigated the following research questions:

1. What is the effect of the LiPS program on students' phonemic awareness skills between Kindergarten and Grade One?
2. What is the effect of the LiPS program on *at-risk* students' phonemic awareness skills between Kindergarten and Grade One?
3. What is the effect of teachers' perceptions of the LiPS program on phonemic awareness skills of Grade One students?
4. What is the effect of teachers' perceptions of the LiPS program on phonemic awareness skills of *at-risk* Grade One students?

1.2 Definitions

For the purpose of this paper, it is important that terminology be clearly defined as it relates to beginning reading acquisition. Stakeholders in the field of education have

used terms that appear to be interchangeable. However, a distinction for the current study is important.

1.2.1 Phonological Awareness

"Phonological awareness refers to a sensitivity to any size unit of sound" (Yopp & Yopp, 2000, p. 130). The units of sound include groups of sounds, as in syllables, word parts (e.g., as in /sm/ and /ell/ in the word /smell/), word families (e.g., /smell/ and /bell/), or individual phonemes in a word. Snow et al. (1998) suggested, "The term *phonological awareness* refers to a general appreciation of the sounds of speech as distinct from their meaning. When that insight includes an understanding that words can be divided into a sequence of phonemes, this finer-grained sensitivity is termed *phonemic awareness*" (p. 15).

1.2.2 Phonemic Awareness

Several definitions of phonemic awareness have been posed and conform to the basic principle presented by Abbott, Walton, and Greenwood (2002). "Phonemic awareness refers to an understanding of how spoken language is linked to written language. Specifically, it is the ability to first distinguish and then to manipulate the individual sound units, or phonemes, in words" (Abbott et al., 2002, p. 25). Yopp and Yopp (2000) defined phonemic awareness as "the awareness that the speech stream consists of a sequence of sounds – specifically phonemes, the smallest unit of sound that makes a difference in communication" (p. 130), and suggested that it is a type of phonological awareness.

1.2.3 Phonics

Even though the term, phonics, is not used extensively in this study, it is a term referred to most often by the general population. It is understood as "a way of teaching reading and spelling that stresses symbol-sound relationships (in alphabetic orthographies)" (Yopp & Yopp, 2000, p. 131). This instructional approach is dependent on the development of phonological and phonemic awareness.

1.2.4 At-Risk

At-risk is the term used to refer to a specific group of students who demonstrated skills that put them at risk of developing or experiencing reading difficulties (Scanlon & Vellutino, 1997). Researchers such as Coyne, Kame'enui, Simmons, and Harn (2004) and McNamara et al. (2005) have used *at-risk* to refer to a group of children whose scores on assessment instruments fall below a specified percentile. Based on the stringency of the test, the cut-point for group identification can vary. Snow et al. (1998) stated,

> When using a nationally standardized reading test…the cut-point for identifying reading difficulties can be set at a particular agreed-on level (e.g., the 25th percentile). The location of the cut-point necessarily determines the incidence and prevalence of reading difficulties in the population. (p. 94)

1.3 Significance of the Study

Educational practitioners are bombarded with program publishers making claims of increased learning for children. When practitioners understand the underpinnings of the reading task, they can make instructional choices based upon current and authentic research (Chhabra & McCardle, 2004; Reyna, 2004). This study gathered relevant

research data that promote *best practice* of reading instruction relating to early intervention and phonemic awareness. By evaluating an instructional program based on the principles of *best practice,* specifically LiPS (Lindamood & Lindamood, 1998), other influential factors in program delivery were explored. The results of this study will provide direction to stakeholders regarding policy initiatives.

1.4 Chapter Organization

A review of the related literature in regards to constructs of reading deficit prevention and a detailed descriptions of the LiPS program (Lindamood & Lindamood, 1998) follows in Chapter 2. A description of the research methods and procedures employed will be presented in Chapter 3, while an analysis of the data will be presented in Chapter 4. The final chapter, Chapter 5, summarizes the conclusions of the study, implications for practice, and directions for further research.

CHAPTER 2: LITERATURE REVIEW

The review of the literature related to reading acquisition and early intervention for reading difficulties during the primary grades is organized into two major sections. The first section critically reviews constructs of reading intervention that specifically explores: (a) *best practice* and its basis in reading instruction, (b) literacy development and the impact of early identification and intervention, (c) the principle of phonemic awareness, and (d) the role of teacher perception on instructional practices. The second section examines the detailed components of the Lindamood Phoneme Sequencing (LiPS) program (Lindamood & Lindamood, 1998).

2.1 Constructs of Reading Deficit Prevention

2.1.1 Best Practice Definition

In defining *best practice,* Zemelman, Daniels, and Hyde (2005) stated that the term is "used to describe solid, reputable, state-of-the-art work in a field" (p. vi). *Best practice* are standards that consider contemporary research to provide consumers with "the latest knowledge, technology and procedures" (Zemelman et al., 2005, p. vi). In regards to education, Zemelman et al. (2005) defined *best practice* as "serious, thoughtful, informed, responsible, state-of-the-art teaching" (p. vi). They further stated, "learning goals for children can be described in Best Practice terms—progressive, developmentally appropriate, research-based, and eminently teachable" (Zemelman et al., 2005, p. 6).

Effective practice and *evidence-based* reading instruction are terms that are synonymous with *best practice* (Armbruster, Lehr, & Osborn, 2003). "In addition to identifying effective practices, the work of the National Reading Panel challenges educators to consider the evidence of effectiveness…By operation on a 'what works' basis, scientific evidence can help build a foundation for instructional practice" (Armbruster et al., 2003, p. iii). Some of the suggested effective instructional practices that *best practice* defined in learning to read are a combination of principles of instruction (Cambourne, 2002) and key components of reading that are primary skills required for acquisition (Adams, 1990; Armbruster et al., 2003; NRP, 2000; Snow et al., 1998). Those primary reading skills are based on language and begin with a conceptual understanding of the alphabetic principle and eventually progress to the final stage of reading for comprehension.

2.1.2 Components of Reading

Critical skills are required by children learning to read (Adams, 1990; Bowman & Treiman, 2004; Bursuck et al., 2002; Lennon & Slesinski, 1999; Mathes et al., 2005; Snow et al., 1998; Torgesen, 2000). Adams (1990) stated that reading for meaning is dependent on the recognition of individual words, but recognized, "it is a whole complex system of skills and knowledge" (p. 3). Phonic instruction was acknowledged as necessary for developing reading and writing skills (Adams, 1990). "Research…confirms that letter recognition facility and phonemic awareness are causally related to reading acquisition and that each is prerequisite for the young reader" (Adams, 1990, p. 7). Once this awareness is established, "reading proficiency is strictly limited by the speed, accuracy, and effortlessness with which readers can respond to print as

coherent orthographic, phonological, and semantic (meaning-bearing) patterns" (Adams 1990, p. 8). Finally, a connection is made between the basic reading skills and the purpose of reading. Adams (1990) concluded, "that skillful readers' word recognition and comprehension processes depend on sophisticated syntactic abilities" (p. 9). The skills identified by Adams (1990) are repeatedly supported in research that followed her book by primary authors such as, Castiglioni-Spalten and Ehri (2003), Coyne (2001), Lennon and Slesinski (1999), Lindamood and Lindamood (1998), McCutchen, Abbott, et al. (2002), Murray, Smith, and Murray (2000), Scanlon and Vellutino (1997), Snow et al. (1998), Torgesen (2000; 2004), and Truch (1994).

In reference to "the mechanics of reading," Snow et al. (1998, p. 321) supported Adams' (1990) conclusions. "There is converging research support for the proposition that getting started in reading depends critically on mapping the letters and the spellings of words onto the sounds and speech units that they represent" (Snow et al., 1998, p. 321). As well, the alphabetic principle and phonological structure influence reading, and these basic skills are foundational to comprehension (Snow et al., 1998). "Comprehension can be enhanced through instruction that is focused on concept and vocabulary growth" (Snow et al., 1998, p. 322). Again, the reading components identified by Snow et al. (1998) are congruent to the components Adams (1990) recognized.

Following the work of Adams (1990) and Snow et al. (1998), the National Reading Panel (NRP, 2000) responded to the U.S. congressional request to provide a report that highlighted the key features of reading instruction. The committee reported "research-based knowledge, including the effectiveness of various approaches to teaching

children to read" (NRP, 2000, p.1). Besides drawing conclusions based on the knowledge gleaned, the NRP (2000) also made recommendations for dissemination of results and future research directions. The assessment yielded the following chosen topics for in-depth analysis for reading instruction: (a) alphabetics (which included phonemic awareness and phonics instruction); (b) fluency; (c) comprehension (which included vocabulary, text comprehension, teacher preparation, and comprehension strategies instruction); (d) teacher education and reading instruction; and (e) computer technology and reading instruction (NRP, 2000).

Armbruster et al. (2003), drawing on the report of the NRP (2000), were another team who elaborated on the key features of reading. Specifically they investigated alphabetics, fluency, and comprehension, and presented an instructional guide condensed for classroom use. The document provided a resource for teachers that summarized, described, analyzed, and discussed the results of the NRP (2000). Teachers were given specific information that had direct classroom implications and instructional strategies for teaching reading (Armbruster et al., 2003). As the constructs of critical reading components were established during the last several decades, these ideas have transformed into instructional principles of *best practice* for reading acquisition.

2.1.3 Principles of Best Practice

Even though instructional theory has been proposed in light of various perspectives, including operant learning, information processing, and social-cognitive models, *best practice* is fundamental to instruction despite the theoretical underpinnings. In operant learning, it is believed that the environment influences antecedents and consequences to produce behaviour, while the social-cognitive model suggests that

learning is socially constructed (Bos & Vaughn, 2002). Bos and Vaughn (2002) described the information processing theory as a focus on executive functioning of the brain where "sensory input is perceived, transformed, reduced, elaborated, stored, retrieved, and used" (p. 55).

Regardless of which theory a practitioner bases their instructional practice, learning and teaching can be thought of as a four dimensional framework that complement the instructional theories. The framework included: "1) explicit teaching, 2) systematically planned teaching, 3) mindful teaching, and 4) contextualized teaching" (Cambourne, 2002, p. 32). These *best practices* for teaching children to read have been extended, analyzed, and supported by experts in the field (e.g., Adams, 1990; Snow et al., 1998; Torgesen, 2004).

2.1.3.1 Explicit and Systematic Teaching

When explicit instruction is defined, it is consistent with explicit reading instruction. Torgesen (2004) defined the term *explicit instruction,* as "instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own" (p. 363). Cambourne (2002) connected the definition of explicitness to the reading task. "Explicit teaching refers to the practice of deliberately demonstrating and bringing to learners' conscious awareness those invisible processes, understandings, knowledge, and skills they need to acquire if they are to become effective readers" (Cambourne, 2002, p. 33).

Reading specialists and researchers have determined the basic reading skills required for the task of reading. They have linked the learning of these skills to explicit instruction in order for reading and spelling to be effortless (Bowman & Treiman, 2004;

Snow et al., 1998). Bursuck et al. (2002) declared, "Indeed, at-risk readers may require more explicit instruction early on, with more implicit instruction coming into play later as their word reading skills become more fully developed" (p. 8). Snow et al. (1998) determined that,

> First-grade instruction should be designed to provide: (1) explicit instruction and practice with sound structures that lead to phonemic awareness; (2) familiarity with spelling-sound correspondences and common spelling conventions, and their use in identifying printed words; (3) sight recognition of frequent words; and (4) independent reading, including reading aloud. (p. 194)

Even though the concept of systematic teaching is often coupled with explicit instruction, the term *systematic* should be defined. Cambourne (2002) defined the concept of systematic instruction as:

> …instruction that is based on proactive, rational planning. It is evidenced by formal planning documents that indicate the teacher has thought ahead and developed and documented a blueprint of future lessons, activities, resources needed, and assessment procedures that will be used. (p. 34)

Systematic teaching and learning is more often described in terms of a comprehensive approach that includes time and intensity required for preventive or remedial instruction. Torgesen (2004) acknowledged that limited information exists regarding specifics of time and intensity of reading instruction. However, research on reading intervention has indicated that instruction needs to be more intensive than typically provided in the regular classroom if reading difficulties are to be prevented or remediated (Torgesen, 2004).

References are made to both explicit and systematic teaching simultaneously. "Intervention researchers currently have a good understanding of the kinds of knowledge and skill that must be taught and have learned that this knowledge and skill must be taught explicitly and systematically to struggling readers" (Torgesen, 2004, p. 363). Reading programs need to include "intensive, comprehensive, and explicit instruction" (Bursuck et al., 2002, p. 4). Morrow, Tracey, Gee Woo, and Pressley (1999) described the work of exemplary teachers and stated, "Teachers provided varied experiences that were developmentally appropriate and also included an emphasis on skill development. Teaching was explicit, direct, and systematic" (p. 474). Besides explicit, systematic instruction, effective instruction is recommended to also incorporate mindful and contextualized teaching.

2.1.3.2 Mindful and Contextualized Teaching

Based on the third dimension of teaching, Cambourne (2002) associated mindful teaching with *meta-cognition* stating, "I equate this with meta-cognitive awareness; that is, the state of being consciously aware of what is going on, of being consciously aware of other possibilities, given the context" (p. 35). Similar to *meta-cognition*, Cunningham and Cunningham (2002) presented their instructional theory as *cognitive clarity*, and stated, "There are some principles that apply to everything that is taught. As we consider how phonics should be taught, we must not overlook that all instruction must help learners develop cognitive clarity and become engaged with what they are learning" (p. 87). Even though Morrow et al. (1999) do not refer specifically to the terms of *mindful teaching*, *meta-cognition*, or *cognitive clarity*, their suggested types of instructional strategies contribute to this concept. Having observed children's reading development as

a part of an effective classroom, the researchers indicated that teachers "included experiences designed to foster the construction of meaning, problem-solving, and taking advantage of spontaneous teachable moments" (Morrow et al., 1999, p. 474). Strategies that develop *meta-cognition* are approaches presented in a meaningful context.

The final dimension, contextualized teaching, is employing instructional strategies that promote contextualized learning (Cambourne, 2002). "Contextualized learning is learning that makes sense to the learner. Because it makes sense, such learning is not only less complicated, but it is also more likely to result in robust, transferable, useful, and mindful learning" (Cambourne, 2002, p. 35). Contextualized learning can be associated with Morrow et al.'s (1999) identified strategies, which include authentic and spontaneous instruction. As observed in effective classrooms, Morrow et al. (1999) stated, "The instruction in early literacy that we observed involved explicit skill development taught in the context of authentic literature" (p. 474). In this case, authentic literature was presented in theme-based units that crossed curriculum domains, and capitalized on *teachable moments* that provided spontaneity (Morrow et al., 1999).

In addition to *best practice*, researchers have identified constructs that contribute to the prevention of reading difficulties. They include early literacy, identification, early intervention, phonemic awareness, and teacher perception and knowledge.

2.1.4 Early Literacy

Constructs in the prevention of reading difficulties include *best practice* of reading instruction. Additionally, early literacy development is believed to impact later reading acquisition. "Young children begin to acquire literacy-related skills long before

they are able to read or spell individual words. These skills pave the way for an understanding of the alphabetic principle" (Bowman & Treiman, 2004, p. 295).

Reading and early literacy has been extensively studied throughout the last several decades, and many researchers and theorists have identified stages of its development. Bowman and Treiman (2004) acknowledged that early literacy included logographic, alphabetic, and phonemic awareness/phonetic awareness stages of development. However, in a collection of articles organized by the International Reading Association, Inc. (IRA; 2002), four more stages of development are included: phonetics, reading fluency, vocabulary development, and reading comprehension. These stages of development are similar to components that the *Early Literacy Guidance* (University of the State of New York, State Education Department, 2002) drew from research: (a) phonemic awareness; (b) word recognition; (c) background knowledge and vocabulary; (d) fluency; (e) comprehension; and (f) motivation to read.

Theorists separated literacy phases in a variety of ways, and some phases are subdivided further to clarify the progressive development of a skill and how children use these skills in learning to read. For example, Scarborough (2001) described early literacy as a process with intertwining *strands* that contribute to proficient reading. These strands included two major categories, language comprehension and word recognition. Language comprehension included: (a) background knowledge; (b) vocabulary; (c) language structures; (d) verbal reasoning; and (e) literacy knowledge. Word recognition included: (a) phonological awareness; (b) decoding; and (c) sight recognition (Scarborough, 2001, p. 98).

Other reading development theories described by Stuart and Coltheart (1988) also identified specific sequential stages of progression in early literacy development. Even though similarities and differences existed among them, recognized sets of skills and sub-skills are important in understanding reading acquisition and the differences among children. Scarborough (2001) identified that the differences in children's skills may also impact reading development. "It is now abundantly clear that reading acquisition is a process that begins early in the preschool period, such that children arrive at school having acquired vastly differing degrees of knowledge and skill pertaining to literacy" (Scarborough, 2001, p. 97). The individual differences demonstrated by children is better understood in the progressive skill development for reading acquisition, therefore making possible identification of children deficient in one or more reading abilities.

2.1.5 Identification

If the subset of skills can be determined for early literacy that are necessary for reading, children at a very early school age can be assessed as possessing or lacking these skills. Snow et al. (1998) acknowledged that aspects in children's knowledge of and proficiency in language predicts later reading achievement. Snow et al. (1998) confirmed that children at risk for reading difficulties should be identified by using a combination of measures in early stages so that appropriate intervention is provided.

The authors of *Preventing Reading Difficulties in Young Children* conducted a meta-analysis of reading prevention research (Snow et al., 1998). "The committee reviewed research on normal reading development and instruction; on risk factors useful in identifying groups and individuals at risk of reading failure; and on prevention, intervention, and instructional approaches to ensuring optimal reading outcomes" (Snow

et al., 1998, p. 2). The result of their meta-analysis presented: typical reading development, reading difficulties and their associated risk factors, common preventions and interventions for children in pre-school to third grade, and actions and obstacles that suggested practice, policy, and research (Snow et al., 1998).

Although the work of Snow et al. (1998) informed various areas of reading deficit prevention, of particular interest here, they believed that "identifying reading difficulties is essential for young school-age children, to ensure that intervention can be offered early and targeted to the children who need it most" (Snow et al., 1998, p. 99). "Individuals with reading difficulties are those whose achievement levels are lower than those of the rest of the people in the distribution" (Snow et al., 1998, p.93).

McNamara et al. (2005) conducted a longitudinal study that proposed to "design and evaluate the efficacy of a tool that could be used in Kindergarten classrooms to identify children at risk for reading difficulties" (p. 80). They stated; "Children in Kindergarten can reliably be identified as *at-risk* for word reading difficulty on the basis of their performance on tasks that assess phonemic awareness and naming abilities" (McNamara et al., 2005, p. 82). Within the context of the study, the researchers also examined the possible existence of the Matthew Effect (Stanovich, 1986). This theory proposed, "children who were poor in their pre-reading skills in kindergarten were falling further behind their grade level peers in grade one" (McNamara et al., 2005, p. 93). Finally, McNamara et al. (2005) explored the issue of misidentifying children at risk for reading failure.

McNamara et al. (2005) teamed with school district personnel to design a screening tool administered by classroom teachers, to over 500 Kindergarten children.

The tool specifically measured phonemic awareness (phoneme identity, blending, and word rhyming) and naming letters with their corresponding sounds, two key reading components identified as predictors of reading success (Adams, 1990; Snow et al., 1998). The same children were reassessed a year later on phoneme blending, segmenting, identification, and letter-naming, in addition to a sight word reading sub-test (McNamara et al., 2005).

First, the results of the study indicated that the screening tool accurately identified children at risk for reading failure, because "children who performed poorly on one measure tended to perform poorly on others" (McNamara et al., 2005, p. 94). Second, children considered *at-risk* in Kindergarten would likely continue to experience reading difficulties in later years. This was determined by the regression analyses of Kindergarten task performance in letter/sound correspondence and phonological awareness predicting Grade One word reading performance (McNamara et al., 2005). McNamara et al. (2005) believed that the primary purpose of early identification could lead to early intervention and prevention. These researchers were confident that adopting such a tool served an important purpose (McNamara et al., 2005).

> By identifying these children in Kindergarten we were able to empower elementary classroom teachers to begin the process of providing these children with necessary supports and interventions. This process may include…spending more concentrated time and effort on increasing the child's reading program. (McNamara et al., 2005, p. 94)

To optimize learning time during the primary years and within the classroom setting, early identification can influence instructional planning. Vellutino et al. (1996)

conducted a longitudinal study of Kindergarten to fourth grade students to test the response of young readers to early intervention. An initial sample of 1407 children were administered psychological tests that evaluated cognitive abilities related to reading acquisition, beginning literacy skills, and Word Identification and Word Attack sub-tests from the Woodcock Reading Mastery Tests- Revised (WRMT-R; Woodcock, 1987). One hundred and eighteen students, identified as poor readers through a teacher-rating criterion referenced tool designed by the researchers, were assigned to a tutored group. Sixty-five randomly selected students who rated as normally developing readers comprised the non-tutored group (Vellutino et al., 1996).

The results of the study indicated "that the largest percentage (67.1%) of poor readers who received daily one-to-one tutoring scored within the average or above average ranges on standardized tests of reading achievement" (p. 629). Vellutino et al. (1996) supported an identification system of phonological processing skills.

> Children who are at risk for reading difficulties can be identified and treated before they are exposed to formal instruction in reading. By attempting to remediate deficiencies in children who are lacking in rudimentary reading skills, we may not only increase the probability of providing them with the foundational skills necessary for success in beginning reading, but…we may be better able to tailor subsequent instruction to their individual needs. (Vellutino et al., 1996, p. 632)

McNamara et al.'s (2005) and Vellutino et al.'s (1996) findings supported that assessment processes can accurately determine the reading skills of children. Once

identified as lacking prerequisite skills, early intervention practices can be employed to prevent reading failure.

2.1.6 Early Intervention

The importance of early intervention is based on the premise that instructional strategies are employed in a school so that students "experiencing reading difficulties receive intensive instruction beginning in kindergarten" (Coyne, Kame'enui, and Simmons, 2004, p. 233). Everhart (2004) believed you could predict the level of a student's success in reading based on delayed reading development. "Research has shown that there is nearly a 90 percent probability that a child will remain a poor reader at the end of the fourth grade if the child is a poor reader at the end of the first grade" (p. 77). Other researchers support the same opinion. Scanlon and Vellutino (1997) suggested that when children struggle to read in the beginning, these students would likely continue to struggle in reading. If instruction is planned to target reading skills during this period of development, children may be able to overcome their difficulties and become proficient at reading (Scanlon & Vellutino, 1997). Delayed reading at this beginning stage is directly linked to a deficit in phonemic awareness.

> The earliest studies were designed to demonstrate a correlation between phonemic awareness and early reading achievement, and once this finding was well established, studies were undertaken which demonstrated not only that phonemic awareness and reading achievement were related, but also that the relationship was a causal one. (Elliott, 1996, p. 14)

Repeatedly, researchers indicated that phonemic awareness skills must be explicitly and directly taught. Scanlon and Vellutino (1997) indicated that improved

phonemic awareness of Kindergarten children directly linked to achievement in reading and spelling in later grades. They suggested that, "such activities might include (direct) instruction on letter names and symbol-sound correspondences, as well as activities that encourage the child to attend to sound and letter similarities and differences in spoken and printed words" (Scanlon & Vellutino, 1997, p. 193). Emphasis on these phonemic awareness skills should be a part of the regular Kindergarten program because, "For children who begin kindergarten at risk for reading difficulties, success at the beginning stages of learning to read is related to…the instructional characteristics of their kindergarten language arts program" (Scanlon & Vellutino, 1997, p. 208). Similarly, Lennon and Slesinski (1999) reiterated, "Direct instruction in both the phonological code and alphabetic principle at the early stages of reading development is necessary for some students to develop the efficiency and automaticity necessary to be competent and fluent readers" (p. 354). These authors went on to state, "early intervention in reading has been related to success students have later in their academic years" (Lennon & Slesinski, 1999, p. 354).

Coyne, Kame'enui, Simmons, and Harn (2004) conducted another study of consolidated research, theory, and practice in search for an explanation of long-term intervention effects and the mediating factors that influence early reading development. The evidence presented by the NRP (2000) outlined the general problem area in this article. This research indicated a concerted effort to improve children's level of reading as early in their school career as possible (NRP, 2000). The authors pointed out, "Reading researchers have strengthened their focus on prevention and early intervention

efforts as a primary way to combat reading difficulties before they snowball into long-term RD" (Coyne, Kame'enui, Simmons, & Harn, 2004, p. 90).

Coyne, Kame'enui, Simmons, and Harn (2004) questioned whether early intervention efforts in Kindergarten actually prevented predicted reading difficulties in the first grade, acting like an inoculant, as opposed to insulin-like remediation – ongoing and intensive. Fifty-nine first grade students who were considered at risk of future reading difficulties were randomly assigned to two treatment groups that both received code-based instruction (Coyne, Kame'enui, Simmons, & Harn, 2004). However, one treatment group received additional intensive intervention. Standardized measures were implemented that assessed: phoneme segmentation fluency, nonsense word fluency, oral reading fluency, word attack, word identification, and passage comprehension. The instructional condition was outlined and an observation checklist monitored fidelity of implementation (Coyne, Kame'enui, Simmons, & Harn, 2004). Researchers found increased reading levels of all children in the follow-up measure a year later that were initially identified at risk for reading failure. Results suggested that the code-based reading instruction at the classroom level was effective in assisting students in acquiring mastery of phonological and alphabetic skills.

Coyne, Kame'enui, Simmons, and Harn (2004) supported the inoculation theory as initially proposed by Coyne (2001). They acknowledged; "Factors…may affect or mediate the enduring effects of beginning reading intervention" (Coyne, Kame'enui, Simmons, & Harn, 2004, p. 92). Coyne, Kame'enui, Simmons, and Harn (2004) indicated that caution in generalizing the effects of early intervention in this study is required because the results were dependent on carefully controlled instructional,

methodological, and student factors. Changes to any one or combination of factors could result in radical differences in reading progress.

Other researchers have also examined the benefits of prevention and early intervention of reading difficulties in the primary grades (e.g., Adams, 1990; McNamara, 2005; Snow et al., 1998). It is suggested that if children are receiving effective classroom instruction, identified *at-risk* during the same year difficulties persist, and are provided with remediation of reading skills (phonemic awareness) within a short time frame, they have a greater chance of becoming better readers in the future (Coyne, 2001; Coyne, Kame'enui, & Simmons, 2004; Coyne, Kame'enui, Simmons, & Harn, 2004;).

2.1.7 Phonemic Awareness

The goal of reading is to gain meaning from the text (Adams, 1990; Elliott, 1996; Mathes et al., 2005; Snow et al., 1998; Torgesen, 2000). Therefore, it is imperative that children be provided with instructional support and opportunity to extend the set of skills necessary for reading words. Many children enter Kindergarten ready to develop phonemic awareness abilities. Children entering Kindergarten possess the preliminary skills required to learn more about spoken language since they are usually able to speak and listen (Adams, 1990; Bowman & Treiman, 2004; Pokorni et al., 2004).

Scanlon and Vellutino (1997) presented an argument for code-emphasis theories and suggested, "activities that attune the child to the sound structure of language and that highlight the ways in which the sound system is coded in print are critically important in promoting success in early reading" (p. 203). These researchers' recommendations for phonemic awareness activities are included in the extensive list of activities that develop detection and manipulation skills.

Scanlon and Vellutino (1997) compared whole language and code-based instruction by systematic observational procedures of the language arts programs in classrooms. They hypothesized that the most successful first-grade readers would be those exposed to a code-emphasis approach, and that the cognitive abilities of the students would delineate reading progress within code-based versus whole language instruction. One hundred and fifty one first grade children who scored in the lowest quartile on the Letter Identification sub-test of the WRMT-R (Woodcock, 1987) participated in this study. Participants were further sub-divided into poor, average, and good readers based on Word Identification and Word Attack Basic Skill Cluster of the same standardized assessment (Scanlon & Vellutino, 1997). Results indicated that the best reading progress was made by students who spent more time on phonemic awareness activities. Scanlon and Vellutino (1997) also determined "reading-related cognitive abilities may be influential determinants of reading achievement in first grade" (p. 209). This finding is consistent with the notion presented by Coyne, Kame'enui, Simmons, and Harn (2004) whereby instructional and methodological factors may be influenced by student factors, namely cognitive abilities.

The study by Scanlon and Vellutino (1997) incorporated instructional factors that included intensive phonemic awareness activities foundational to reading progress. Armbruster et al. (2003) also identified phonemic skills as foundational to reading development. They included: phoneme isolation (first sound or last sound), identity (same sound in more than one word), categorization (similar word/sound part), blending (/g/-/o/ says /go/), segmentation (/go/ says /g/-/o/), deletion (repeat /meat/ without /m/), addition (add /s/ to /nob/), and substitution (in /rat/, replace /r/ with /b/). Other activities

that can be used to develop letter to sound correspondence ('p' says /p/) and counting phonemes (number of sounds in /cat/), include: rhyme recognition (given two words that may or may not rhyme), oddity (given three words of which one does not rhyme), and production (students suggest rhyming word); and syllable manipulation, such as isolation, identity, categorization, blending, segmentation, deletion, addition, and substitution of syllables (Elliott, 1996). Skill activities, such as these, develop children's phonemic awareness (Pokorni et al., 2004).

For children to advance their decoding abilities, detection and manipulation skills need to be acquired. For example, Elliott (1996) stated, "…phonemic awareness is the first central skill that underpins the acquisition of the lower-order reading skills of decoding and word recognition. And adequate development of these lower-order skills underpins the ability to comprehend and derive meaning from print." (p. 13). Simply being able to speak (making sounds) and listen (hearing sounds) are not enough to learn to read (Adams, et al., 1991). Elliot (1996) and Adams et al. (1991) believed that children are ready to read when they are conscious of language.

> What I advocate is more careful pedagogical attention to whether or not each child had developed conscious awareness of the existence of phonemes – of the idea that the sounds of syllables can be broken apart. This insight is essential for making sense and use of letter-sound correspondences. (Adams et al., 1991, p. 393)

A large body of research has acknowledged that phonemic awareness is a basic prerequisite of beginning reading achievement, and without it, children struggle to read (Adams, 1990; NRP, 2000; Snow et al., 1998). Adams (1990) and Adams et al. (1991)

observed that phonemic awareness is crucial to reading since student success is based on whether or not they possess that basic understanding. Lance, Beverly, Evans, and McCullough (2003) suggested, "evidence-based reading instruction is…a set of practices that lead to effective literacy learning" and these include "the integration of systematic phonics, [and] explicit strategies-based teaching for decoding" (p. 5). The instructional methods described also involved recognition and manipulation of phonemes and syllables (Lance, et al., 2003).

Individuals read for many purposes and there are numerous markers of early literacy development (Adams, 1990). The function of identification, intervention and remediation of reading difficulties were researched by Coyne (2001), Coyne, Kame'enui, Simmons, and Harn (2004), and McNamara et al. (2005). Armbruster et al. (2003) and Elliott (1996) elaborated on the sub-skills of phonemic awareness. If explicit, systematic instruction of a program to develop phonemic awareness skills during the first years of formal schooling is believed to impact student achievement, teacher knowledge, skill, and perception may also have a substantial impact on teaching children to read.

2.1.8 Teacher Perception and Knowledge

Considering the impact of teacher perception of their knowledge on teaching and learning, researchers declared that teacher preparation in content knowledge and the beliefs that teachers have regarding learning and their own ability to teach has a measurable effect on student outcomes (Bos, Mather, Dickson, Podhajski, & Chard, 2001; Cunningham, Perry, Stanovich, & Stanovich, 2004; McCutchen, Abbott, et al., 2002; McCutchen & Berninger, 1999; McCutchen, Harry, 2002; Richardson, 1996).

Studies that examined the relationship between teacher knowledge, perception, and practice have found that there is an influence on student learning (Richardson, 1996). In studies reported by McCutchen, Abbott, et al. (2002), McCutchen, Harry, et al. (2002), and McCutchen and Berninger (1999), teacher knowledge has been linked to teacher practice.

A teacher-training module described in an article by McCutchen and Berninger (1999) was intended to inform in-service practitioners on current reading research developments. The article documented extensive training in the teaching of reading, classroom observation, and professional consultation as reported by McCutchen and Berninger (1999). The effectiveness of this in-service delivery model was measured by teacher knowledge, teacher practice, and student learning of both an experimental and control group in a study conducted by McCutchen, Abbott, et al. (2002). Prior to training, teachers' knowledge of reading was measured. The experimental group (24 teachers) received extensive reading instruction training, while the control group did not receive the treatment condition (McCutchen, Abbott, et al., 2002). Throughout the following school year, teachers in both the experimental and control classrooms were observed and the literacy developments of students were measured.

McCutchen and Berninger (1999) reported that, "it is possible to effect long-term changes in teacher practice…because they are rooted in teacher knowledge" (p. 224). Similarly, McCutchen, Abbott, et al. (2002) reiterated, "teachers can use that knowledge to change their classroom practice" (p. 80), but McCutchen, Harry, et al. (2002) determined that teacher beliefs did not predict instructional practices of reading to the same degree as content knowledge impacted practice.

The research conducted by McCutchen, Harry, et al. (2002) investigated the relationship between teacher knowledge regarding literature and phonology, instructional reading philosophy, classroom practice, and student outcomes. A limited correlational relationship was found between philosophy and knowledge, and philosophy and practice, but teachers knowledge of phonology correlated with student learning, as did their content knowledge and instruction (McCutchen, Harry, et al., 2002). The implications of this research suggested more in-service training be placed on aspects of teacher's knowledge of phonology that impact instruction, and ultimately, improve student learning.

Another study by Cunningham et al. (2004) measured teacher's knowledge domains in three literacy areas: children's literature, phonological awareness, and phonics. The researchers used the teacher knowledge domain measures to determine if teachers were able to calibrate their knowledge; "knowledge calibration is concerned with whether people are aware of what they know and do not know" (Cunningham et al., 2004, p. 143). Researchers designed tasks to measure teachers' knowledge of phonological awareness and phonics. They also accessed a literature recognition tool. These results were used to measure the degree of calibration with the questionnaire regarding teachers' perception of their instructional skills and content knowledge (Cunningham et al., 2004). Cunningham et al. (2004) found:

> Teachers tended to overestimate, rather than underestimate, their knowledge. Overestimation can limit or constrain one's level of receptivity to learning new information. In contrast, an accurate awareness of the limitations of one's

> knowledge can presumably increase the actions that one would take to acquire new information and experiences. (p. 157)

Further they stated, "There are strong theoretical reasons to suspect linkages between teacher knowledge and ability to teach reading effectively…Correspondingly, a stronger empirical base from which to set policy and develop professional development curricula is needed"(Cunningham, et al., 2004, p. 160). Although the study did not make a direct link to professional development, Cunningham et al. (2004) alluded to teacher practice when they stated, "Teachers…lack a degree of technical knowledge that is relevant and that many consider fundamental to the teaching of reading." (p. 161).

Other studies (Bursuck et al., 2002; Mather et al., 2001) have documented the impact of instructional preparation associated with teachers' knowledge, perception, and skill. Mather et al. (2001) believed that it is critical for classroom teachers to have a firm grasp of how to teach reading explicitly. They suggested "teachers need to possess positive perceptions regarding the role of systematic, explicit instruction and a knowledge of language structure" (Mather et al., 2001, p. 472). Researchers compared the perceptions and content knowledge of pre-service and in-service teachers. Mather et al. (2001) believed that teachers require knowledge of sound-symbol correspondences, the alphabetic principle, language elements, and their relationship to written language. Also, teachers need to be cognizant of "the relationship between poor phonological awareness and reading failure, as well as a knowledge of how to implement activities in classroom instruction to develop phonological awareness" (Mather et al., 2001, p. 473). Results indicated "general education teachers with 3 or more years of experience had a more positive view of the role of explicit code-based instruction in teaching reading" (Mather

et al., 2001, p. 478). Even though researchers have confirmed predictive variables that influenced reading development, Mather et al. (2001) doubted that teacher preparation have been impacted by those research results.

Information is available to practitioners in understanding influences such as early literacy and phonemic awareness on reading acquisition. In addition, instructional influences like identification, early intervention, best practice, teacher perception, and teacher knowledge impact student achievement in reading (Snow et al., 1998). But, the question to be answered is how the acquisition of phonemic awareness can be supported in a classroom setting, small group instruction, or one-on-one remediation. Adams (1990) suggested to effectively and efficiently deliver phonemic awareness training requires "systematic instruction" (p. 28). The Lindamood Phoneme Sequencing (LiPS) program (Lindamood & Lindamood, 1998) is one instructional method that promotes explicit and systematic instruction.

2.2 Lindamood Phoneme Sequencing (LiPS) Program

The Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech (LiPS; Lindamood & Lindamood, 1998), previously called the Auditory Discrimination in Depth (ADD; Lindamood & Lindamood, 1975) program, was introduced more than 40 years ago.

> The Auditory Discrimination in Depth program was designed to directly attack the phonemic awareness problems of children with reading disabilities by helping them discover articulatory cues to the number, identity, and order of phonemes in words. It emphasizes instructional activities that teach children to 'feel' as well as hear, the individual sounds in words. (Torgesen et al., 2001, p. 35)

The LiPS program (Lindamood & Lindamood, 1998) includes four critical instructional components: (1) classifying and labeling speech sounds; (2) multi-sensory processing; (3) questioning and handling errors; and (4) tracking sounds with concrete objects. Through the use of a questioning strategy, children learn to classify and label speech sounds using multi-sensory channels of information processing so that they are able to track those sounds in sequence. One of the key features of the program is the emphasis it placed on articulation of phonemes (Castiglioni-Spalten & Ehri, 2003; Lindamood & Lindamood, 1998; Pokorni et al., 2004) and its connection to the alphabetic system. Castiglioni-Spalten and Ehri (2003) believed that children having awareness of "articulation gestures" with its graphophonemic counterpart assists in identification and recall of written words (p. 26). The mouth position pictures of vowels and consonants included in the program provide directed attention to how specific sounds are produced, and are initially used to present the concept of word segmenting as they can be scrutinized and manipulated (Lindamood & Lindamood, 1998). The program designers also included a system of labeling those pictures for increased understanding of the phoneme. This multi-sensory approach to gaining phonemic awareness has traditionally been used for new language acquisition, but the theory is applicable to children who have or may not have difficulty learning to read (Sparks et al., 1998).

Multi-sensory learning style is evident in other features of LiPS (Lindamood & Lindamood, 1998). The questioning style recommended by the authors leads children to discover the connection of gestures and sound production. This connection-forming process, labelled by Castiglioni-Spalten and Ehri (2003), is congruent with the concept of "meta-linguistic analysis and discovery" (Scanlon & Vellutino, 1997, p. 210). The

process of forming connections for cognitive processing is paralleled with another program trait that "divides auditory processing into five general processes: sensory input, perception, conceptualization, storage, and retrieval" (Pokorni et al., 2004, p. 151).

The LiPS program (Lindamood & Lindamood, 1998) is effective in developing phonemic awareness, where a majority of instructional time is dedicated to developing and practicing this skill (Pokorni et al., 2004; Torgesen, 2000; Torgesen, Alexander, et al., 1999; Torgesen et al., 2001; Truch, 1994; Wise, Ring, & Olson, 1999). These researchers indicated that explicit instruction of phonemic awareness skills had improved reading outcomes for children identified as possessing decreased levels of phonological processing abilities. Further to this, Pokorni et al. (2004) stated there is "significant short- and long-term increases in reading skills" (p. 155). If practitioners regard current research cautiously and assume methods of effective practice, program planning would include both phonemic awareness training and reading comprehension. Phonemic awareness and reading comprehension provide the foundation of and purpose for reading. "Phonemic awareness instruction must be viewed by educators as only one part of a much broader literacy program" (Yopp & Yopp, 2000, p. 132).

2.2.1 Critical Program Components

The *explicit* and *implicit* features of the LiPS program (Lindamood & Lindamood, 1998) distinguish the critical components and teaching strategies that support skill acquisition. Program designers clearly outlined the developmental sequence with possible differentiating instructional practices, providing explicit directives for program delivery (Lindamood & Lindamood, 1998). The underlying critical features of the program are also pointed out. Even though the underlying critical features are stated

directly, to the practitioner they are implicit instructional practices (i.e., questioning techniques). These implicit instructional practices are essentially techniques requiring a level of expertise that teachers use in order to be successful in teaching children to read and write (Lindamood & Lindamood, 1998).

The explicit sequence of this program is described as "a progression of five levels" (Lindamood & Lindamood, 1998, p. 8). Before actually beginning the instruction, the facilitator (in most cases, the classroom teacher) sets the climate for learning. This is accomplished by engaging students in understanding the learning process, and how they, the students, will play an active role in their own learning. Lindamood and Lindamood (1998) suggested that teachers introduce the concept of sensory information integration (a combination of sensory information – sight, sound, and touch), which is achieved through the students own discovery process. For example, students discover the difference between *voiced* and *unvoiced* sound by feeling the vibrations in their throat or covering their ears. The critical components of setting the climate, where children are invited to discover and understand *how* to learn, are basic to the ability to *think* about language (Lindamood & Lindamood, 1998).

The second level involved identifying and classifying speech sounds through a multi-sensory approach (Lindamood & Lindamood, 1998). Categories such as *lip poppers* (/p/ and /b/), *tip tappers* (/t/ and /d/), and *tongue scrapers* (/k/ and /g/) are described and labelled. Here, students categorize sounds by the way they are articulated, comparing and contrasting what is "heard, seen, and felt, as the sound is produced" (Lindamood & Lindamood, 1998, p. 10). The label given to consonants and vowels helps students to associate the sound of the letter(s) to the multi-sensory information they have

interpreted. Consonants are paired as *voiced* and *unvoiced* or "grouped according to a uniform characteristic of production, but not a specific sameness of mouth movement" (Lindamood & Lindamood, 1998, p. 10). The remaining consonants are referred to as *borrowers* that make use of other consonant sounds. Vowels, too, are carefully disseminated through multi-sensory mechanisms and presented in a half circle that represents tongue placement, mouth movement, and shape. Depending on the age of the children, teachers may present the letter symbols as the sounds are being introduced, or after mastery of sound classification/identification (Lindamood & Lindamood, 1998).

Tracking speech sounds is the third level in the progression of skills (Lindamood & Lindamood, 1998). Beginning with isolated sounds, and eventually moving toward sounds in syllables, students use pictures (depicting their sound classification) and coloured blocks to "indicate the number, order, and sameness or differences of the sounds they feel and hear" (Lindamood & Lindamood, 1998, p. 11). In other words, students are given a pattern of isolated sounds, or simple to complex syllables, and they must indicate both when and what they hear using coloured blocks or pictures to represent those sounds. During this activity, a single sound in the given pattern may be "added, omitted, substituted, shifted, or repeated" (Lindamood & Lindamood, 1998, p. 12), and the students are required to demonstrate the change. The words used for the tracking chains are nonsense words, but may include real words. For instance, the student would use coloured blocks or pictures to demonstrate /pa/, changed to /ma/, changed to /me/.

Although the fourth level is listed separately, Lindamood and Lindamood (1998) suggested that sound-symbol associations are exercised while tracking speech sounds so that the link to spelling and reading is made. Once students have mastered the

representation of phoneme order using concrete manipulatives, the same chains are given to students where letter tiles are used or spelling patterns are recorded. Ultimately, students first track isolated speech sounds using pictures, then coloured blocks, and finally, letter tiles. Using both real and pseudo words, the same processes are repeated with simple syllables, and then complex single syllables and multi-syllabic words (Lindamood & Lindamood, 1998).

"Self-correction in speech and self-generating, self-correcting activity in spelling and reading" (Lindamood & Lindamood, 1998, p. 13) is the fifth and final level of the program that targetted the goal of LiPS (Lindamood & Lindamood, 1998). At this stage, students combine their learned auditory skills to the sound-symbol relationship in order to read and write words, beginning with simple single syllables (/cat/) and progressing through to multi-syllabic words (/inception/). Again, students use tiles with the printed letters to form real and pseudo words incorporating their *sight* with previously identified and classified multi-sensory associations before they write the words on their own (Lindamood & Lindamood, 1998). Reading involves two tasks: interpreting letter sequences as speech sounds (i.e. decoding) and attaching meanings to real words (i.e. encoding). The intent of the LiPS program (Lindamood & Lindamood, 1998) is to provide students with the skills to decode. The program designers briefly address contextual reading and spelling in the final chapter, but qualify that this step can be exercised by existing reading programs and/or other available reading materials (Lindamood & Lindamood, 1998). The program designers have endorsed another program, Visualizing and Verbalizing (Bell, 1991), that targets reading comprehension. To reinforce the acquisition and automaticity of phonemic skill development, they also

recommended any high interest content reading series that are conducive to the LiPS (Lindamood & Lindamood, 1998) progression.

2.2.2 Critical Instructional Components

Although explicitly stated, implicit techniques for program implementation are vital to the success of the LiPS program (Lindamood & Lindamood, 1998). The strategies are intended to stimulate the cognitive processing so that students are actively engaged in meta-linguistic analysis. (Lindamood & Lindamood, 1998) These techniques are instructional strategies teachers may inherently possess or develop through professional experience. Lindamood and Lindamood (1998) indicated four specific, interrelated, techniques: (a) questioning; (b) multi-sensory experience; (c) classifying and labelling sounds; and (d) tracking sounds with concrete objects.

The questioning technique recommended by program designers serves two purposes – error correction and concept introduction (Lindamood & Lindamood, 1998). "The responding-to-the-response questioning is important not only in introducing concepts, but also in handling students' errors" (Lindamood & Lindamood, 1998, p. xiii). On this premise, the questioning strategy helps students to *think* about sounds and organize and structure their knowledge so it has further application. Lindamood and Lindamood (1998) explained, "Skillful questioning must be used to direct the active physical and mental processing of students until they receive sensory input clearly enough to perceive and describe what they are experiencing" (p. xv).

The multi-sensory experience, that includes hearing, seeing, and feeling, is not independent of the questioning process, but rather an interdependent relationship exists

(Lindamood & Lindamood, 1998). Questioning leads students to discover characteristics and features of sound that connect sensory information to cognitive processing.

> In this level of the program, the students learn to use information from the ear, eye, and mouth to identify, classify, and label individual consonant and vowel sounds, and to associate the sound they hear themselves say, the appearance of the mouth action when the sound is made, and the physical sensation of making the sound. (Lindamood & Lindamood, 1998, p. 10)

Through questioning, students conceptualize sounds based on information from several sensory input canals (i.e. auditory, visual, and kinesthetic), which allow them to classify and label these sounds. "This classifying and labeling process is crucial because it provides a structure within which the students can judge contrasts and relationships among sounds" (Lindamood & Lindamood, 1998, p. 10). The identification process provides a structural foundation on which to organize the sensory information being perceived, making it possible to discriminate sounds in sequence, the very process of developing phonemic awareness (Lindamood & Lindamood, 1998).

Developing phonemic awareness is a precursor to the more global task of reading and spelling (Abbott et al., 2002; Adams, 1990; Elliott, 1996; Snow et al., 1998). Once this skill is mastered, the final step toward reaching that goal is the ability to track sounds in sequence. "Tracking sounds with concrete objects is one of the keys to the LiPS approach" (Lindamood & Lindamood, 1998, p. 11). This is accomplished by using materials that graduate from concrete to abstract. Using pictures of the mouth that represent the classified sounds, students sequence the pictures representing the given sounds either in isolation or in syllables (Lindamood & Lindamood, 1998). Students

graduate to using more abstract tracking systems, like coloured blocks, and finally, letter symbols. This final feature begins to get at the skill of manipulating sound order that allows individuals to read and spell words (Lindamood & Lindamood, 1998).

2.2.3 Goals and Intended Outcomes

The goals and intended outcomes of the LiPS program (Lindamood & Lindamood, 1998) include several targets, and once consolidated, foster the ability of students to decode and encode words effectively and efficiently (Lindamood & Lindamood, 1998). Upon examining the critical features of the program and analyzing the stated objectives, the consistency of the program is noteworthy. The objectives are explicit, and the features of program delivery are compatible with the stated objectives. Truch (1994) indicated that after reviewing various programs and strategies that target phonological awareness, "The ADD program incorporates a number of essential features that I believe make it unique and powerful in dealing with the phonological awareness problems that seem to plague so many disabled readers" (p. 62). Three general target areas include phonemic awareness, sensory-cognitive processing, and meta-linguistic development. (Lindamood & Lindamood, 1998, p.7)

Lindamood and Lindamood (1998) indicated that developing phonemic awareness is of primary importance to reading acquisition. One of the key features of the program is the emphasis it places on articulation of phonemes (Castiglioni-Spalten & Ehri, 2003; Lindamood & Lindamood, 1998; Pokorni et al., 2004) and its connection to the alphabetic system. "The LiPS Program addresses the development of phonemic awareness as a base for accurate reading and spelling" (Lindamood & Lindamood, 1998, p. 4). Lindamood and Lindamood (1998) suggested that phonemic awareness

development should come before or be a part of the regular reading curriculum. Further, they stated, "…that the key to helping individuals develop phonemic awareness/auditory conceptual function and become independent in reading and spelling lies in involving the conscious integration of the three senses of *hearing, seeing,* and *feeling* in the task" (Lindamood & Lindamood, 1998, p. 6).

The second target is sensory-cognitive processing, the ability that drives phonemic awareness development (Lindamood & Lindamood, 1998). This is accomplished through questioning interactions between student and teacher, since questioning is based on sensory perceptions when sounds are produced. "This questioning elicits the sensory-cognitive connections that are the goal of the LiPS Program" (Lindamood & Lindamood, 1998, p. xiii). The authors continued by linking questioning and sensory-cognitive processing to phonemic awareness. "The power of the LiPS Program is found in its focus on the primary source of sensory information that identifies phonemes - *the oral-motor activity that produces them*" (Lindamood & Lindamood, 1998, p. 6).

Given the skills necessary to critically analyze what is heard, seen, and felt, as a match or mismatch, children have been provided the explicit opportunity to develop the ability to think about language. "The final goal of the LiPS Program is self-correction in speech and self-generating, self-correcting activity in spelling and reading" (Lindamood & Lindamood, 1998, p. 13). With these newly acquired skills, students are able to interactively engage in receptive and expressive language experiences.

Finally, Lindamood and Lindamood (1998) connected the overall objective of efficiently decoding and encoding words to the targetted goals that support of the features

of program delivery. This is accomplished by developing phonemic awareness assisted through levels of cognitive processing in order to teach children to read and write within various instructional environments. Truch (1994) stated that the ADD program (Lindamood & Lindamood, 1975) is intended for both classroom and remedial instructional settings.

> The program can be used as an "early intervention" program or with reading-disabled students of any age. A number of school districts have used the program as an early introduction to reading with grade 1 students and many resource teachers have used the program in their classes with disabled readers. (Truch, 1994, p. 63)

The developmental sequence of the proposed five levels using specific instructional strategies can be delivered in whole group, small group, or individual settings to develop phonemic awareness (Lindamood & Lindamood, 1998). Research studies have examined the effectiveness of the LiPS program (Lindamood & Lindamood, 1998) and its foundational theories, and have reported generally supportive results with acknowledged limitations.

2.2.4 Research of Program

Specific research studies have analyzed student outcomes to determine the effectiveness of the LiPS program (Lindamood & Lindamood, 1998). Studies have compared instructional methods, within group differences using a pre-test/post-test format, and examined program effects of whole group, small group, and one-on-one settings (e.g., Pokorni et al., 2004; Torgesen et al., 2001; Truch, 1994).

Significant growth in phonemic awareness was noted for participants in Truchs' (1994) study. In another study, the LiPS program (Lindamood & Lindamood, 1998) was compared to two other phonologically focused programs (i.e. Fast ForWord (Scientific Learning Corporation, 1999) and Earobics (Cognitive Concepts, Inc., 1998)), and the LiPS approach (Lindamood & Lindamood, 1998) demonstrated positive learning outcomes (Pokorni et al., 2004). Students who received remedial one-on-one instruction showed similar improvement in reading growth in extensive research studies conducted by Torgesen and two teams of researchers (Torgesen, Alexander, et al., 1999; Torgesen et al., 2001). Other studies have examined the instructional effects of articulation on phonemic awareness development (Castiglioni-Spalten & Ehri, 2003; Wise et al., 1999). Each of these studies will be examined in detail.

Studies have considered the LiPS programs' (Lindamood & Lindamood, 1998) effectiveness in improving phonemic awareness in a clinical setting. For example, Truch (1994) investigated how phonological awareness was affected by the ADD instructional approach (Lindamood & Lindamood, 1975). He collected data that measured achievement outcomes in phonological awareness for students who had received intensive one-on-one instruction using the ADD program (Lindamood & Lindamood, 1975). Even though the study is limited by the lack of a comparison group, Truchs' 281 participants, aged 5 to 55 years of age, received ADD instruction (Lindamood & Lindamood, 1975) after self-referral or referral by the school or family. Clients were screened before and after instruction using a test battery that included tests of phonological awareness, sound-symbol association, decoding, word identification, spelling, oral reading, and vocabulary. Those pre- and post-test measures provided

dependent means for analysis. Clients were instructed a minimum of 80 hours of prescribed therapy over four weeks, where clinicians followed the scope and sequence of the ADD program (Lindamood & Lindamood, 1975). Results indicated that a treatment effect existed for the group of subjects and observed were "highly significant gains on all variables" (Truch, 1994, p. 72). However, this study only considered the phonemic awareness skills of one group of subjects; it did not incorporate a comparison group in its design that would monitor the effects of a control group or a group that received another treatment option.

Pokorni et al. (2004) conducted a comparison research study of the LiPS (Lindamood & Lindamood, 1998), Earobics (Cognitive Concepts, Inc., 1998), and Fast ForWord (Scientific Learning Corporation, 1999) programs. The purpose of the study was to determine the effectiveness of three instructional methods that claim to improve "phonemic awareness, language, and reading-related skills" (Pokorni et al., 2004, p. 148), where children ranged in age from seven to nine years. Mean raw scores from the sub-tests, which included blending phonemes, segmenting phonemes, concepts and directions, recalling sentences, listening to paragraphs, letter-word identification, passage comprehension, word attack, and spelling, prior to and following the treatment were reported. Pokorni et al. (2004) examined individual students' within and between group comparisons. Differences in program delivery included the intervention schedule, time allocated for intervention, and size of student groups. The measures used in a pre-test/post-test research format were identical for students of all treatment conditions. Students' ability to blend and segment phonemes was measured before and after intervention treatment using the Phonological Awareness Test (PAT; Robertson & Salter,

1997). Reading skills were assessed with sub-tests from the Woodcock Language Proficiency Battery – Revised (WLPB-R; Woodcock, 1991) that measured letter-word identification, passage comprehension, word attack, and spelling. A repeated standardized measure of language skills, the CELF-3 sub-tests (i.e., Clinical Evaluation of Language Fundamentals – 3, Semel, Wiig, & Secord, 1995) that included understanding concepts, following directions, recalling sentences, and oral passage comprehension, were conducted.

Pokorni et al. (2004) conducted multiple multivariate analyses of variance, and "found a significant effect of group in phonemic awareness only…The LiPS intervention did a significantly better job that the other two interventions to improve students' ability to blend phonemes" (Pokorni et al., 2004, p. 155). The results from the phoneme segmentation, language, and reading tests did not show significant gains in student learning when comparing the instructional methods (Pokorni et al., 2004). However, analyses within each group noted significant gains made by students on phonemic awareness skills who received LiPS (Lindamood & Lindamood, 1998) instruction (Pokorni et al., 2004).

Torgesen, Alexander, et al. (1999) conducted a study where the effectiveness of three instructional programs was compared to a control group (NTC). The study's purpose was to determine what impact the conditions of instruction had on preventing reading difficulties in children. One treatment condition consisted of phonological awareness and phonics development (referred to as PASP) based on the ADD program (Lindamood & Lindamood, 1975). The second intervention was referred to as the Embedded Phonics (EP) program where phonics development results from the context of

reading and writing exercises. Finally, the third treatment condition was instructional activities within the context of the regular classroom program (RCS). Participants were selected from a pool of students deemed at risk for reading failure in Kindergarten and provided intervention until the end of second grade. Before intervention, testing included phonological processing, cognitive and language assessments, and academic achievement of several reading skills. Outcomes were measured at the end of each school year and reported various word reading skills and comprehension, in addition to spelling and calculations only in the last year. Students assigned to the condition using ADD - PASP treatment group (Lindamood & Lindamood, 1975) indicated, "significantly stronger skills than those in the EP group in phonological awareness; phonemic decoding; and untimed, context-free word reading…children in the PASP group were also stronger on word level reading skills than children in the RCS and NTC group" (Torgesen, Alexander, et al., 1999, p. 589).

In another study, Torgesen et al. (2001) were interested in determining whether intervention using one of two individualized instructional methods (i.e. LiPS and Embedded Phonics) improved the basic skills of students to reflect average reading ability. Torgesen et al. (2001) evaluated program effectiveness relating to instructional activities and student characteristics. The ADD program (Lindamood & Lindamood, 1975) focused on developing phonemic awareness using articulatory cues and phoneme tracking of words. Embedded Phonics treatment group developed phonic skills through reading and writing and was designed by the research team for this study (Torgesen et al., 2001). Their research compared instructional approaches on a similarly sized participant pool of 60 who were struggling readers beyond the second grade.

Torgesen et al. (2001) randomly assigned students to one of two treatment conditions, the ADD (Lindamood & Lindamood, 1975) and Embedded Phonics programs, "both of which were phonemically explicit and systematic but varied in method of instruction and in depth and extent of phonemic practice" (p. 35). Pre-test data collection included sub-tests in 12 standardized assessment tools (e.g. Comprehensive Test of Phonological Processes (CTOPP; Wagner, Torgesen, & Rashotte, 1999); WRMT-R, (Woodcock, 1987); Test of Word Reading Efficiency (TOWRE; Torgesen, Wagner, & Rashotte, 1999); Gray Oral Reading Test – III (GORT-3; Wiederholt & Bryant, 1992); Kaufman Test of Educational Achievement (Kaufman & Kaufman, 1985); CELF-3 (Semel et al., 1995); Wechsler Intelligence Scale for Children – Revised (WISC-R; Wechsler, 1974)) that measured phonological awareness and memory, reading skills, academic achievement in spelling and math, sensory, language, and cognitive functioning. Behavioural assessments were measured using three teacher checklists, and questionnaires collected demographic and historical information. Three follow-up assessments were conducted immediately following intervention, and again one and two years following intervention. Assessment measures included measurements of reading, language, phonological, rapid naming, memory, spelling, and mathematic skills. The ADD treatment (Lindamood & Lindamood, 1975) produced greater gains in decoding, "reading accuracy and fluency of word reading in text" (Torgesen et al., 2001, p. 51) during intervention. However, they acknowledged that "the overall pattern of growth in the treatment and follow-up periods indicates that the outcomes for the two methods were much more similar than different" (Torgesen et al., 2001, p. 51).

The implementation of the LiPS (Lindamood & Lindamood, 1998) or ADD program (Lindamood & Lindamood, 1975) and its effect on student outcomes in numerous word reading skills have been considered by numerous researchers (e.g., Pokorni et al., 2004; Torgesen et al., 2001; Truch, 1994). Other studies (Castiglioni-Spalten & Ehri, 2003; Wise et al., 1999) have scrutinized instructional techniques, specifically articulation emphasis, promoted by Lindamood and Lindamood (1998). Castiglioni-Spalten and Ehri (2003) believed that "sensitizing children to phonetic articulatory properties of words will contribute to their word reading and spelling" (p. 27).

Forty-five Kindergarten students (29 girls and 16 boys) who had no formal phonemic awareness or reading instruction, but were considered to be partially competent in the alphabetic principles, knowing 13 of 17 target letters, were included in the study. Participants were assigned to either: (1) a group (mouth condition) that were trained to associate pictures of mouth positions with their corresponding sounds; (2) a group (ear condition) who were trained to associate coloured blocks with the segmented sounds in words; or (3) a control group who received no treatment condition (Castiglioni-Spalten & Ehri, 2003). The treatment group received six instructional sessions.

Results indicated that both the articulatory and auditory methods were effective in improving phonemic awareness (PA) and spelling skills. However, only the mouth condition demonstrated improvements on the reading tasks administered as a post-test immediately following intervention and again, one week later. Based on the results, the researchers suggested:

> If children need to gain articulatory awareness for PA instruction to be completely effective and to have maximum transfer value, then teaching this ingredient explicitly is the best way to ensure that it is learned. If the articulatory method proves to be more engaging and motivating than the ear method, as our results suggested, then teachers may have an easier time teaching PA if they use mouth pictures. Finally, if articulatory training facilitates the connection forming process in remembering how to read words, then teaching PA in this way may exert a bigger impact on sight word learning. (Castiglioni-Spalten & Ehri, 2003, p. 49)

This study supported phonemic awareness development emphasized by articulation, but was limited by sample size, gender composition, and long-term measurable outcomes of phonemic awareness (Castiglioni-Spalten & Ehri, 2003). Wise et al. (1999) addressed some of these concerns in their study.

Wise et al. (1999) also attempted to examine the effects of "articulatory awareness and phoneme manipulation" (p. 275). Wise et al. (1999) compared "two conditions… the phonological awareness with and without articulatory awareness conditions…[and] included two additional conditions: a condition that trained articulatory awareness and phonics without exercises in phonemic/letter manipulation, and regular-instruction control condition" (p. 276). The 122 participants, aged 7 to 11 years, were selected for the study based on achievement scores below the 10^{th} percentile on standardized reading pre-tests, the WRAT (Jastak & Wilkinson, 1984) and the PIAT (Dunn & Markwardt, 1970), and were of average intelligence. Participants were tested four times: before, during, following intervention, and again one year later. Student

progress was measured with the use of the following tests: word recognition, phonological decoding, phoneme awareness, nonword repetition, orthographic coding, spelling, reading comprehension, and arithmetic (Wise et al., 1999). Researchers detailed the instructional conditions that were common and/or unique to each treatment group and analyzed the results. Wise et al. (1999) acknowledged that gains were notable in all treatment conditions.

> These results are empowering for teachers. They suggest that teachers should learn about language, reading, and children's learning strengths and weaknesses; and then tailor the methods they learn to meet the needs of students and to account for the teachers' own strengths, knowledge, and experience. (Wise et al., 1999, p. 301)

Wise et al. (1999) summarized their recommendations for practitioners to include elements of phonological awareness, phonics instruction, sounding out, and self-correction of errors when reading, all of which are an integral part of the LiPS program (Lindamood & Lindamood, 1998).

Several research studies supported the effectiveness of the LiPS program (Lindamood & Lindamood, 1998) and the learning theories on which it is based (e.g., Pokorni et al., 2004; Torgesen et al., 2001, Truch, 1994). The instructional components of the program promote higher level thinking for meta-linguistic analysis, and the levels of progression target phonemic awareness improvement along a developmental continuum (Lindamood & Lindamood, 1998). No published research studies were found that considered a whole group instructional setting and the extent of influence of instructional approach on student achievement in phonemic awareness and reading

acquisition. There is considerable need for further evaluation of program implementation in classroom settings. This would assist teachers and support personnel in their efforts to effectively and efficiently teach children to read.

2.3 Summary

In an attempt to determine if student achievement of a specific skill can be measured, and to what extent the outcome may be impacted by perceptions of teachers, background literature provided evidence that phonemic awareness development at an early instructional stage would impact reading acquisition. *Evidence-based* reading instruction provided support for further investigation.

In order to teach children to read, *best practice* prescribed skill components (phonemic awareness and fluency) and instructional principles (explicit and systematic instruction) that are supported extensively in research. Children's understanding of the alphabetic principle, fluency, and comprehension are essential to the task of reading for meaning (Snow et al., 1998). Researchers also recognized that teacher training is also essential to children's success in reading (Adams, 1990). With *what* needs to be taught established, research relating to instructional methodology has supported explicit, systematic, mindful, and contextual teaching that leads to efficient and effective learning (Cambourne, 2002).

Student knowledge of the alphabetic principle is important to reading (Adams, 1990; Snow et al., 1998). One element of this principle is phonemic awareness. Established extensively in research, phonemic awareness is believed to predict later reading success (Lennon & Slesinski, 1999). There is also believed to be a critical period

for phonemic awareness development, said to be most significant before the end of first grade (Scanlon & Vellutino, 1997).

Children's reading may benefit in a more timely fashion in school systems where early intervention strategies are employed as opposed to older children who receive remediation for reading difficulties (Coyne, Kame'enui, Simmons, & Harn, 2004). In order to provide early intervention instruction, students may be identified as lacking one or more early literacy skills that are prerequisite for reading acquisition (McNamara et al., 2005).

Many programs have been developed to assist practitioners in teaching children to read – programs that target the development of phonemic awareness at an early age. One program, LiPS (Lindamood & Lindamood, 1998), designed based on a sensory-cognitive processing philosophy, was intended to improve efficient and accurate word decoding and encoding. Research has indicated that children who receive LiPS (Lindamood & Lindamood, 1998) instruction as early intervention (Torgesen, Alexander, et al., 1999) or remediation (Truch, 1994) made gains in their abilities to manipulate phonemes, and these abilities impact reading skills (Castiglioni-Spalten & Ehri, 2003).

Teachers' training influenced student learning. Researchers have studied teacher content knowledge of reading and their skill perception that are believed to be influential in teaching children to read (Cunningham et al., 2004). Investigations revealed a link between teacher perception, knowledge, and practice (McCutchen, Abbott, et al., 2002). The question remains; is there a relationship between student achievement and teacher perception, knowledge, and practice?

The current research study attempts to explore student achievement in reading within the classroom instructional context. Phonological awareness and the degree of correlation between levels of reading achievement in decoding and teacher perception, knowledge, and practice specific to LiPS (Lindamood & Lindamood, 1998) will be measured. In addition, possible variations between typically achieving students and those identified *at-risk* will be explored.

CHAPTER 3: METHODOLOGY

3.1 Nature of the Study

The purpose of this study was to: (1) describe the extent of change in the phonemic awareness skills of children from Kindergarten to Grade One who received instruction using the Lindamood Phoneme Sequencing (LiPS; Lindamood & Lindamood, 1998) method; and (2) examine the relationship between teachers' perception of their knowledge of the LiPS program and student outcomes. In the current study, the treatment, assessment, and instructional methodology administered by teachers were endorsed by their school district as an early literacy initiative that encouraged use of LiPS (Lindamood & Lindamood, 1998) as a phonemic awareness instructional program. The following research questions guided the study:

1. What is the effect of the LiPS program on students' phonemic awareness skills between Kindergarten and Grade One?
2. What is the effect of teachers' perceptions of the LiPS program on phonemic awareness skills of Grade One students?
3. What is the effect of the LiPS program on *at-risk* students' phonemic awareness skills between Kindergarten and Grade One?
4. What is the effect of teachers' perceptions of the LiPS program on phonemic awareness skills of *at-risk* Grade One students?

3.2 Participants

Forty-five Grade One teachers of single or multi-graded classrooms, who were employed by a rural school division in central Saskatchewan, were invited to participate in this study. Of the eligible participants, 16 teachers agreed to participate in the study. Scores on the pre- and post-test measures included 227 students that were instructed by the teachers who volunteered to participate in this study.

3.3 Instrumentation

3.3.1 Teacher Survey Tool

The first instrument, the Grade One Classroom Teacher Survey Form (see Appendix A), was a self-report questionnaire developed for use in this study. Nine forced choice items based on a four-point Likert scale were used to investigate teachers' perceptions of their knowledge of the levels of progression (i.e., no experience, minimal experience, proficient, and expert) and instructional methodologies (i.e., strongly disagree, somewhat disagree, somewhat agree, and strongly agree) outlined by the program developers of LiPS (Lindamood & Lindamood, 1998). Teachers were also asked to complete a demographic information section (i.e., teaching experience, pre-service training, in-service training).

In order to verify clarity of wording in the survey instrument, two groups of individuals were approached and commented on the questionnaire. Two people who were trained by the developers of the LiPS program (Lindamood & Lindamood, 1998) considered the tool as representative of the critical features and philosophy of the program. One individual commented that the levelling statements were relevant to the success of the LiPS process (Lindamood & Lindamood, 1998), but questioned whether

their perceptions would actually reflect fidelity of implementation. The second expert pointed out that the "double negative makes answering somewhat tricky" (personal communication, April 6, 2006). Two teachers who have used the LiPS program (Lindamood & Lindamood, 1998) as their preferred instructional approach agreed that all the critical features of the program were addressed. However, one teacher voiced their concern in differentiating between *proficient* and *expert* when asked to describe their current knowledge or skill level for the statements that targeted the instructional components of the program.

3.3.2 Student Screening Tools

The remaining two instruments were screening tools (LDWC, 2002; 2005) used to gather information on student achievement in phonological awareness. Permission to use the instruments for this study were requested from (see Appendix B), and granted by the Learning Disabilities Working Committee – LDWC (see Appendix C). The LDWC was a committee of practitioners in neighbouring school jurisdictions whose goal was to provide support to teachers in strengthening classroom instruction in language arts to ensure equal opportunities for students who experienced learning difficulties. The screening tools were developed by LDWC for early identification of reading difficulties, and used to measure student progress in a longitudinal study reported by McNamara et al. (2005). The Kindergarten screening tool (LDWC, 2005) (see Appendix D) had been administered to over 500 students each year for five years, while the Grade One screening tool (LDWC, 2002) (see Appendix E) had been available to teachers for four years prior to the start of the current study. Demographic variables, such as age and gender, were included in both of the student assessment instruments. Sub-tests common

in both screening tools tested phoneme identity, phoneme blending, symbol recognition of upper case and lower case letters, and sound-symbol association for lower case letters only.

3.3.2.1 Common Screening Tasks

The phoneme identity task in the Kindergarten screening tool (LDWC, 2005) and the Grade One screening tool (LDWC, 2002) each included 15 items that identified consonant and vowel phonemes. Possible scores on this task range from 0 to 15. Scripted directions and a model were provided for the teacher as a part of the screening tools. For each item, the teacher read a sentence of eight words or less, and then asked the child to repeat the sentence. A phoneme was identified and the child was asked to repeat the sound. Finally, the teacher supplied two words that were similarly phonetically structured and asked the child to identify which word contained the identified phoneme. (e.g., "His chin is too thin"). The child repeated the sentence. The teacher then identified a phoneme and asked the child to repeat the sound (e.g.,"Now say /ch/)". Finally, the teacher asked the child to identify in which word the phoneme is present. "Do you hear /ch/ in chin or thin?" This process was repeated for each item as questions became progressively more difficult.

Phoneme blending included directions for teachers to administer eight items, with a maximum length of four sounds to Kindergarten students, and 12 items with up to five sounds to Grade One students. Possible scores on this task range from 0 to 8 and 0 to 12, respectively. The teacher segmented the phonemes of a word and asked the student to put the sounds together to make a word (e.g., "If I say /p/ /i/ /g/ the word is …[pig]").

In the letter recognition task, stimulus sheets that contained all letters of the alphabet were provided to the student. The teacher pointed to an upper case or lower case letter and asked the child to identify its name. Children were also required to identify the sound made by lower case letters only. Possible scores on this task range from 0 to 100 percent.

3.3.2.2 Grade Specific Screening Tasks

Specific to the Kindergarten screening tool (LDWC, 2005) was a sub-test of rhyming words. Following instruction and model administration, children were asked to determine if two words rhymed by giving a yes/no response. For example, the words /boy/ and /toy/ were given and the child determined if they rhymed, and responded *yes* or *no.* Possible scores on this task range from 0 to 20.

The Grade One screening tool (LDWC, 2002) also contained additional sub-tests that were age-appropriate, based on levels of phonemic development. Phoneme segmenting involved the test administrator saying a word and asking the student to segment the phonemes. For example, the teacher said, "Say the word *dog*. Now say the sounds in *dog*." The student responded by segmenting the phonemes, "/d/ /o/ /g/". This sub-test included 15 items, up to a maximum length of five phonemes. Possible scores on this task range from 0 to 15. The final task for Grade One students included a list of 20 words where students were asked to read each word. Possible scores on this task range from 0 to 20. This task measured their sight word knowledge – reading proficiency – as opposed to the their ability to segment and blend words, as indicated in the scoring note to teachers on the word reading protocol page.

The research team (McNamara et al., 2005) responsible for designing this instrument, in conjunction with practitioners who were administering the assessment in the early stages of test development, began to collect evidence regarding its content validity. In a pilot study, examination by teachers and reading specialists was considered for the appropriateness of instrument format, content, representation of sample items, and student performance (M. Scissons, personal communication, March 6, 2006). In regards to reliability, a member of the test development team (J. K. McNamara, personal communication, November 24, 2005) confirmed that the internal consistency (Cronbach's coefficient alpha) for the entire Kindergarten inventory was .8239. The internal consistency of each sub-test, determined using a split half technique, was as follows: phoneme identity (r= .82); phoneme blending (r= .78); rhyming (r= .79); upper case letter identity (r= .91); lower case letter identity (r= .90); and letter sounds (r= .89). In the longitudinal study (McNamara et al., 2005) for which this assessment was designed, the researchers indicated that high with-in grade correlations ranged from .29 to .93 for Kindergarten and .37 to .70 for Grade One. The across grade correlations ranged from low to moderately high (i.e., .16 to .57) as stated by McNamara et al. (2005). Test reliability was unknown for the Grade One assessment tool but it is believed to have similar content validity to the Kindergarten protocol (J. K. McNamara, personal communication, November 24, 2005).

3.4 Data Collection

During the planning stages of this study, the school jurisdiction indicated their support of the proposed research (see Appendix F). Student application for Approval of a Research Protocol was submitted to the Office of Research Services at the University of

Saskatchewan on February 7, 2006, and approved on April 13, 2006 (see Appendices G and H). Permission was requested from the Director of Education and the accompanying Board of Education to conduct the approved research (see Appendix I). Cover letters addressed to the Grade One teacher and the school principal (see Appendices J and K) briefly outlined the research project and described the study and the expectations of the researcher. At the same time, teacher consent forms (see Appendix L) and the Grade One Classroom Teacher Survey Form (see Appendix A) were available for completion. Teachers who wished to participate were asked to complete the questionnaire and return it with a copy of the consent form to the division office by May15, 2006, at which time data entry began. In addition, the researcher provided a parent information letter for informed consent (see Appendix M).

Kindergarten teachers, trained by test developers, administered the phonological awareness tasks and the letter/sound identification sub-test of the screening tool before the end of May of 2005. Teachers recorded the raw data on a summary sheet. The same procedure, administered by the Grade One teachers who volunteered for this study, was repeated using the Grade One screening tool (LDWC, 2002). This administration took place in May and June, 2006. Participating teachers were asked to submit the class summary form containing raw data from the Grade One screening tool (LDWC, 2002) to division office where students and teachers were numerically coded, allowing for the completion of data entry.

With the screening tools already distributed in the schools, no procedures were required for test circulation. Blank record sheets were delivered by fax (or interoffice mail) to the teacher one month prior to the May deadline. After assessments were

complete, class summary sheets containing raw data were forwarded to the central administration office. Since the school division already practiced this data collection procedure, the research being conducted did not interfere with that process. Data collection of the Kindergarten screening results were made available to the researcher in May, 2006. Data collection of Grade One screening results required by the researcher paralleled the school division's assessment timeline.

Upon approval from the University of Saskatchewan Behavioral Research Ethics Board, written contact with in-school administrators and teachers were made so participants could indicate their intent. Participant confidentiality was ensured by the assignment of a numbered code system. The researcher established this code so that students and teachers could not be identified. Data will be locked, secured, and stored by the researchers' university supervisor for a minimum of five years. In consideration of risk to students, the study minimized these risks as the treatment condition had already been applied within the context of the classroom. The early literacy initiative advocated by the school division had been ongoing for five years, and many primary teachers within the jurisdiction were practicing the teaching strategy under study. Parents of students in the classes being examined were informed of the proceedings and an informational letter was distributed. In regards to practitioners, they were assured that their privacy was obligatory, and that they were free to withdraw from the study at any time. A signed consent form was required from the teachers who volunteered. Results will be reported in the form of a brief summary available upon request. Participating teachers and interested parties will be invited for data debriefing once research was completed.

3.5 Data Analysis

Data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS). Conducting frequency distributions showing minimum and maximum range for each variable performed a quality check of the data to verify that all entered data were not outside the expected range of scores for each sub-test. After initial data entry, a quality check to ensure accuracy was conducted by four individuals who randomly selected a minimum of 20% of student scores and demographic data in each class. All teacher survey data was checked multiple times. Cases were monitored for missing data after students and teachers had been numerically coded. Missing test scores from individual sub-tests were not included in the statistical analysis. Average scores were substituted for missing data. Data analyses with both missing data and average scores substituted were conducted, and no changes to significance occurred.

Independent teacher variables that included teaching experience, university training in reading and other areas of specialization, LiPS (Lindamood & Lindamood, 1998) training, and classroom methodology practice from the teacher questionnaire were collected. The four-point Likert scale that addressed the teacher knowledge or skill level (i.e., no experience, minimal experience, proficient, and expert) and level of agreement (i.e., strongly disagree, somewhat disagree, somewhat agree, and strongly agree) with the critical features of the LiPS program (Lindamood & Lindamood, 1998) were described through measures of central tendency (i.e., mean) and measures of variability (i.e., standard deviation). Categories were collapsed due to the uneven distribution of responses from the sample. Some of the categories contained very few or no responses, so analysis in those cases were nonexistent.

Student achievement and demographic information collected from the two screening instruments included both categorical (i.e., age and gender) and continuous variables (i.e., phonemic awareness skills and letter/sound identification). Once the data was collected and analysis began, it was learned that the pilot Kindergarten screening tool had 20 rhyming items as opposed to 15 items in the published copy. Since data was collected based on the pilot study the previous year, analyses were based on the data from the 20 items tested.

Each research question guided the analyses employed for the study. Variations in statistical analysis depended upon rate of response and data distribution of the dependent variables. As a result, categories of specific variables were collapsed (e.g., teaching experience was collapsed into 10 or more and nine or less years; levels of agreement were categorized into two groups – agreement and disagreement) to interpret results. Since the sample was not normally distributed, Spearman's R was employed as the nonparametric correlation coefficient instead of the more common Pearson R. Levene's Test for Equality of Variance was an additional method employed due to the non-normality of the data used for analyses in the current study.

3.5.1 Research Question 1

The first research question posed was: what is the effect of the LiPS program (Lindamood & Lindamood, 1998) on students' phonemic awareness skills between Kindergarten and Grade One?

First, the pre- and post-means for each screening sub-task were compared to determine if there was a change in phonemic awareness skills of children during their first grade year. Descriptive analyses that included measures of central tendency and

variability were conducted. T-test for dependent means was used to compare means of the student screening.

3.5.2 Research Question 2

The second research question posed was: what is the effect of the LiPS program (Lindamood & Lindamood, 1998) on *at-risk* students' phonemic awareness skills between Kindergarten and Grade One?

Descriptive statistics that included measures of central tendency and variability, as well as t-tests to compare means, were employed for analyzing *at-risk* Grade One students change in phonemic awareness and letter/sound identification. Those students who scored in the lowest quartile of any sub-test of phonological awareness or letter/sound identification in their Kindergarten year were considered *at-risk* and those scores were included for these analyses. Comparisons were also noted for those student considered *not at-risk* of reading failure who scored above the 25th percentile on the Kindergarten screening tool.

3.5.3 Research Questions 3 and 4

The final two research questions posed were: what is the effect of teachers' perceptions of the LiPS program (Lindamood & Lindamood, 1998) on phonemic awareness skills of Grade One students; and what is the effect of teachers' perceptions of the LiPS program (Lindamood & Lindamood, 1998) on phonemic awareness skills of *at-risk* Grade One students?

As in the two previous research questions, the only qualified difference between all Grade One students and those deemed *at-risk* were the child's scores on the

Kindergarten screening tool. Any child who scored in the lowest quartile on any sub-test was considered at risk for reading difficulties in Grade One. Only those student scores were analyzed in answering the fourth research question.

The final two questions considered the relationship between student outcomes and the data collected from the teacher demographics, knowledge, and perception questionnaire. Bivariate correlational methods were employed to determine the strength of relationships between student achievement on specific sub-test measures and teacher responses regarding their teaching experience, pre-service training, knowledge, and perceived skill level when using the levels of progression and teaching strategies outlined in the LiPS program (Lindamood & Lindamood, 1998).

Results of the data analyses are presented in the fourth chapter of this study and implications of the results are discussed in the final chapter.

CHAPTER 4: RESULTS

4.1 Overview

The purpose of the present study was two-fold. First, the researcher set out to determine if phonemic awareness skills improved for first grade students of teachers who used the LiPS program (Lindamood & Lindamood, 1998). Second, an attempt was made to determine if there was a relationship between reading improvement in decoding and teacher perception of their knowledge of the LiPS program (Lindamood & Lindamood, 1998) and relevant demographic variables.

Sixteen Grade One teachers in one rural school division participated in the study. Teachers completed a teacher survey that included demographic information and perception checks of their knowledge and beliefs of beginning reading instruction and LiPS program (Lindamood & Lindamood, 1998) implementation. At the end of the school year, participating teachers administered an individual assessment of phonemic awareness, word reading, and letter/sound identification to the 227 students in their classes.

Specifically, the mean scores of sub-tests on a Grade One screening were compared to mean scores of sub-tests that assessed the same skills one year earlier on a Kindergarten screening assessment. The sub-tests used in these analyses included two areas: phonemic awareness and letter/sound identification. A comparison of the entire student sample was conducted, and then an *at-risk* group was identified and the mean

scores were examined. Correlational analyses were conducted to determine the relationship between teacher perception and student improvement in reading skills. Teaching experience and methodology, teacher training, knowledge of the LiPS program (Lindamood & Lindamood, 1998), and best practice for reading instruction were correlated with students' outcomes on the Grade One screening assessment.

4.2 Research Question Results

4.2.1 Research Question 1

The first research question posed was: what is the effect of the LiPS program (Lindamood & Lindamood, 1998) on students' phonemic awareness skills between Kindergarten and Grade One?

In order to determine the change in phonemic awareness skills from Kindergarten to Grade One, means and frequencies of the raw scores from components of the Kindergarten Screening and Grade One Screening assessments were analyzed. Since phonemic awareness skills and letter/sound knowledge are believed to predict later reading success, assessment of both areas were included in the study. However, only those sub-tests that were common to the both Kindergarten and Grade One screening tools were used in the analyses. Therefore, assessment of phonemic awareness included phoneme identity and phoneme blending. Letter identification, both upper and lower case, were assessed and converted to a percentage. Likewise, sound identification in lower case format was assessed and scores also converted to a percentage. In order to calculate statistical significance, a paired-sample t-test was used to compare the extent of

change on the common five sub-tests of phonemic awareness and letter/sound identification.

Table 4.1 summarizes the results of the assessment of phonemic awareness. Besides the mean and standard deviation, the median is also reported since the distributions of scores were negatively skewed. Results reveal that the mean score of phoneme identity increased from Kindergarten to Grade One. There was a statistically significant difference between student scores of phoneme identity in Kindergarten and Grade One [$t\ (178) = -13.715$, $p < .05$, $\eta^2 = 0.5138$]. The medium effect size as defined by Cohen (1988) and increased scores suggested practical significance. Assessment of phoneme blending demonstrated an increase between Kindergarten and Grade One. A statistically significant difference was found between the mean scores in the pre-test/post-test study [$t\ (179) = -33.494$, $p < .05$, $\eta^2 = 0.8624$]. Cohen (1988) identified an η^2 of 0.80 as a large effect size. The large effect size and increased scores also suggested a practical significance.

Increased knowledge of letter identification and letter/sound correspondence was measured and summarized in Table 4.2. Again, the median is reported due to negative skewness of scores as well as the mean and standard deviation. Mean percentage scores for upper case letter identification increased from Kindergarten to Grade One. There was a statistically significant difference between student scores of upper case letter identification in Kindergarten and Grade One [$t\ (179) = -5.661$, $p < .05$, $\eta^2 = 0.1519$].

Table 4.1

Comparison of Phonemic Awareness Sub-tests on Kindergarten and Grade One Screening Assessments

Phonemic Awareness Sub-test	*Kindergarten N = 225*			*Grade One N = 220*		
	Median	Mean	SD	Median	Mean	SD
Phoneme Identity*	12	11.73 (15)	2.59	15	14.32 (15)	1.11
Phoneme Blending*	6	5.17 (8)	2.52	12	11.24 (12)	1.36

Note. SD = Standard Deviation; N = sample size. Maximum possible score of task in parentheses.

* $p < .05$

Cohen (1988) identified an η^2 of 0.20 as a small effect size. Even though this effect size was small, the increase in means suggests that the significance was practical. The results were similar for lower case identification as mean scores increased between Kindergarten and Grade One. As was the case for upper case letter identification, the change in mean scores of lower case letter identification was found to be statistically significant [$t (179) = -7.609$, $p < .05$, $\eta^2 = 0.2444$]. Even though the effect size was small, the increase in mean scores still indicates a practical significance. In regards to letter/sound correspondence, a statistically significant difference was also found in the dependent paired sample [$t (178) = -10.972$, $p < .05$, $\eta^2 = 0.4034$]. Cohen (1988) identified an η^2 of 0.40 as a medium

effect size. Again, the medium effect size and increased means support a practical significance.

Table 4.2

Comparison of Letter/Sound Identification in Kindergarten and Grade One

Letter/sound Identification Sub-tests	*Kindergarten*				*Grade One*			
	N	Median %	Mean %	SD	N	Median %	Mean %	SD
Upper case Letter Identification*	226	100.00	86.10	23.42	220	100.00	98.63	7.30
Lower case Letter Identification*	227	92.31	81.04	26.24	220	100.00	98.10	7.42
Letter/sound Correspondence*	225	80.00	70.57	29.17	220	100.00	96.09	8.74

Note. SD = Standard Deviation; N = sample size; % = percentage. Maximum possible score of task in parentheses.

* $p < .05$

4.2.2 Research Question 2

The second research question posed was: what is the effect of the LiPS program (Lindamood & Lindamood, 1998) on *at-risk* students' phonemic awareness skills between Kindergarten and Grade One?

In order to investigate phonemic awareness skills of Grade One students, the student data set was sub-divided based on *at-risk* identification in Kindergarten. A score below the 25th percentile cut-off on any one of the Kindergarten Screening sub-tests categorized students *at-risk* for reading failure. The progress of this group of students was further analyzed in Grade One.

Data analysis of the sub-group deemed *at-risk* was identical to the procedure used to answer the first research question posed in this study. Differences in means and frequencies of raw scores from five sub-tests (i.e., phoneme identity, phoneme blending, upper and lower case letter identification, and lower case letter/sound correspondence) that tested skills in both Kindergarten and Grade One were analyzed. Statistical significance of the common sub-tests of the screening tools was calculated using a paired-sample t-test (i.e., to compare the extent of change in phonemic awareness and letter/sound identification). The analyses were extended to include the comparison of student scores that were not at risk for reading difficulties. Additional analyses and comparisons were allowed when analyzing the scores of students who were deemed *at-risk* and *not at-risk* for reading difficulties.

Table 4.3 summarizes the results of the assessment of phonemic awareness and letter/sound identification of students deemed at risk for reading difficulties on each of the screening assessments conducted during Kindergarten and Grade One

Table 4.3

Comparison of Phonemic Awareness and Letter/sound Identification Sub-tests on At-Risk Sub-groups

Sub-Test	*At-Risk*					
	Kindergarten (N = 111)			Grade One (N = 79)		
	Median	Mean	SD	Median	Mean	SD
Phoneme Identity	10.00	10.14 (15)	2.65	14.00	14.05 (15)	1.21
Phoneme Blending	3.00	3.73 (8)	2.65	12.00	10.90 (12)	1.77
Upper Case Letter Identification (%)	84.62	74.68	27.26	100	97.89	8.69
Lower Case Letter Identification (%)	76.92	68.48	29.47	100	97.36	8.62
Lower Case Letter/sound Correspondence (%)	50.00	51.71	29.61	96.15	94.63	10.34

Note. SD = Standard Deviation; N = sample size; % percentage. Maximum possible score of task in parentheses.

Table 4.4 summarizes the results of students who achieved raw scores above the 25th percentile on all sub-tests in their Kindergarten year; not at risk for reading failure. Five sub-tests common to both screening tools (i.e., phonemic identity, phonemic blending, upper and lower case letter identification, and lower case sound identification) were examined separately as they relate to the students deemed *at-risk* and those students whose scores are considered typical in achievement.

Table 4.4

Comparison of Phonemic Awareness and Letter/sound Identification Sub-tests on Not At-Risk Sub-groups

Sub-Test	*Not At-Risk*					
	Kindergarten (N = 113)			Grade One (N = 99)		
	Median	Mean	SD	Median	Mean	SD
Phoneme Identity	13.00	13.00 (15)	1.69	15.00	14.56 (15)	.97
Phoneme Blending	6.36	6.38 (8)	1.63	12.00	11.51 (12)	.86
Upper Case Letter Identification (%)	100	98.36	4.02	100	99.02	7.49
Lower Case Letter Identification (%)	100	95.06	7.62	100	98.67	7.57
Lower Case Letter/sound Correspondence (%)	92.31	89.13	11.88	100	97.50	7.98

Note. SD = Standard Deviation; N = sample size; % percentage. Maximum possible score of task in parentheses.

In analyzing phonemic identity where 15 items were assessed, the mean score reported in Kindergarten for the *at-risk* and *not at-risk* groups increased in Grade One. Results indicated that there was a statistically significant difference between student scores of phoneme identity in Kindergarten and Grade One for *at-risk* [t (78) = -12.970, $p < .05$, $\eta^2 = .6832$] and *not at-risk* [t (98) = -8.329, $p < .05$, $\eta^2 = .4145$] groups. The

medium effect sizes indicated by the significant change in means for *at-risk* and *not at-risk* students also suggest a practical significance.

The Kindergarten phonemic blending sub-test assessed eight items, and the Grade One sub-test assessed 12 items. Increased mean scores indicated both statistical and practical significance for the *at-risk* sub-group between Kindergarten and Grade One [$t(78) = -23.622$, $p < .05$, $\eta^2 = .8774$]. The *not at-risk* sub-group measured means increased from Kindergarten to Grade One. A statistically significant difference was observed by the paired-sample t-test, [$t(98) = -30.372$, $p < .05$, $\eta^2 = .9040$]. Noteworthy is the large effect sizes of both t-tests.

In analyzing the upper case letter identification sub-test, mean scores for the *at-risk* sub-group in Kindergarten increased in Grade One. Although the effect size was small, the paired-sample t-test revealed a statistically significant difference, [$t(78) = -6.206$, $p < .05$, $\eta^2 = .3305$], also considered a practical significance. Although there was an observed change in the same sub-test of the typically achieving students, there was no statistically significant difference, [$t(98) = -.749$, $p > .05$, *ns*].

Differences in lower case letter identification of Kindergarten students were noted. The Grade One assessment revealed increased means for *at-risk* and *not at-risk* sub-groups. A paired-sample t-test measured a statistically significant difference with a medium effect size in the *at-risk* sub-group [$t(78) = -7.541$, $p < .05$, $\eta^2 = .4217$], and the change is deemed a practical significance. Although a statistically significant difference in lower case letter identification was also noted in the group of typically achieving students, the effect size was very small; [$t(98) = -3.478$, $p < .05$, $\eta^2 = .0110$], which suggests that the significance is not practical.

The final analysis related to this research question was based on student knowledge of letter/sound correspondence. As was the case with lower case letter identification, a statistically significant difference was found for letter/sound correspondence of the students deemed *at-risk*, [t (78) = -11.137, p <.05, η^2 = .6139], as scores increased from Kindergarten to Grade One. Although considered a statistically significant difference by the paired-sample t-test, [t (98) = -6.275, p <.05, η^2 = .2867] for students considered *not at-risk* for reading difficulties , the effect size was small as compared to the medium effect size in the *at-risk* sub-group. In consideration of the importance for mastery of letter/sound correspondence for beginning reading, the increased means, statistical significance, and effect sized contribute to a practical significance.

4.2.3 Research Question 3

The third research question posed was: what is the effect of teachers' perceptions of the LiPS program (Lindamood & Lindamood, 1998) on phonemic awareness skills of Grade One students?

Raw scores from the sub-tests of the Grade One screening assessments and the teacher self-report survey were analyzed to examine the impact of teacher instruction on Grade One student achievement. Student achievement data in phonemic identity, blending, and segmenting, word reading, letter identification of upper and lower case letters, and sound identification of lower case letters were collected. Data from 227 students were used in the analysis. Sixteen teachers reported demographic and experiential information. Nine statements reported by a four-point Likert scale measured teachers' perception of instructional methodologies (i.e., strongly disagree, somewhat

disagree, somewhat agree, and strongly agree) and knowledge of the levels of progression (i.e., no experience, minimal experience, proficient, and expert) outlined in the LiPS program (Lindamood & Lindamood, 1998).

Raw score means and response rates expressed in percentages provided descriptive statistics. Nonparametric correlations using Spearman R, since distribution of scores were not normative, and independent t-tests were used to determine the extent of influence of teacher perception and other self-reported information on phonemic awareness skills of students they taught.

4.2.3.1 Teacher Demographics and Student Achievement

When teachers reported their years of teaching experience, 75% had more than ten years experience while 25% reported having nine or less years teaching experience (see Table 4.5).

Table 4.5

Participants' Years of Teaching Experience

Teaching Experience	*N*	*%*
1-3 years	0	0
4-6 years	2	12.5
7-9 years	2	12.5
More than 10 years	12	75
Total	16	100

Note. N = sample size; % = percentage.

Further data analyses of teaching experience used collapsed categories of 10 years or more and 9 years or less due to the small sample size for the individual categories of teaching experience. A correlation was run to determine the relationship between teacher experience and each of the seven sub-tests in the Grade One screening assessment.

Negative correlations were calculated for phoneme identity at -.156, word reading at -.340, and upper case letter identification at -.163, all of which were significant. Table 4.6 summarizes mean scores, t-test results, and effect sizes.

Table 4.6

Comparison of Teaching Experience on Grade One Phonemic Awareness and Letter/sound Identification Sub-tests

Sub-Test	*Teaching Experience*					
	9 Years or less (N = 57)		10 Years or more (N = 163)			
	Mean	SD	Mean	SD	t-Test	ES
Phoneme Identity (15)	14.00	1.28	14.40	1.01	2.162*	.3533
Phoneme Blending (12)	10.77	1.96	11.34	1.26	2.062*	.3552
Phoneme Segmenting (15)	13.28	2.05	13.10	2.43	-.506	
Word Reading (20)	12.00	4.99	15.88	4.49	5.450**	.8181
Upper Case Letter Identification (%)	96.32	13.77	99.43	1.97	1.699	
Lower Case Letter Identification (%)	95.78	13.79	98.91	2.47	1.705	
Lower Case Letter/sound Correspondence (%)	93.62	15.23	96.96	4.49	1.627	

Note. SD = Standard Deviation; N = sample size; % percentage; ES = effect size. Maximum possible score of task in parentheses.

* $p < .05$; ** $p < .01$

Differences in mean scores were higher when teachers had 10 or more years experience for all but one sub-test, specifically phoneme segmenting, and three of those were statistically significant. This suggests that there was practical significant effect of teaching experience and student outcomes in phonemic awareness and letter/sound recognition.

The teacher survey asked participants to recall the number of university courses taken that specifically addressed reading methods. Of the 16 participants, 13 teachers reported that they had taken one or two classes, three or four classes, or more than four classes (see Table 4.7).

Table 4.7 *Participants' Training in Reading Methods*

Number of Reading Methods Classes	*N*	*%*
1-2 classes	6	46
3-4 classes	4	31
More than 4 classes	3	23
Total	13	100

Note. N = sample size; % = percentage.

Nonparametric correlations that used Spearman R revealed only two negative correlations for phoneme identity (-.134, $p<.05$) and sound identification (-.188, $p<.01$) with reading classes taken by teachers. Upon further examination, an analysis of variance (ANOVA) of phoneme identity revealed statistically insignificant differences of means between the three groups of teacher reading training. The analysis of variance (ANOVA) revealed a statistically significant difference of the sound identification sub-

test (see Table 4.8). The differences found were between scores of students with teachers who had one to two reading training classes and three to four classes, as well as significant differences between three to four classes and more than four reading classes training. Differences were not evident between scores of students with teachers who had one to two classes and more than four reading training classes. Results indicated that formal reading training of teachers did not positively impact student reading achievement in decoding consistently.

Responses to specialized training at the university level were coded into two categories. Of the twelve participants who reported their specialized training, three (25%) were categorized as having unrelated formal training, while 11 (75%) were categorized as having formal related training. The second category included teachers who identified the following areas of specialty: Early Childhood Education, English Language Arts, Elementary, Reading, and Special Education. Nonparametric correlation using Spearman R revealed one negative correlation with the word reading sub-test (-.258, $p<.01$) that was statistically significant. Another correlation (.211, $p<.01$) was noted in specialized training and student scores on the sound identification sub-test. Mean scores of students with teachers who had related training were all higher than scores of students with teachers who reported unrelated training. However, only the word reading sub-test revealed a statistically significant difference and a medium effect size, [$t (182.853) = 4.334$, $p<.01$, $\eta^2 = .5989$], equal variances not assumed, scoring of 16.14 (SD = 4.21) and 13.30 (SD = 5.29) out of 20, respectively. Cohen (1988) judged effect sizes for ANOVA's as: (1) 0.1 was small; (2) 0.2 was medium; and (3) 0.4 was large.

Table 4.8

Analysis of Variance for Reading Methods Training

Dependent Variable	Number of Classes	Mean	F value	df	Power	PC
Phoneme Identity (15)	1-2 classes	14.43	1.679	2, 217		
	3-4 classes	14.10				
	More than 4 classes	14.29				
Phoneme Segmenting (15)	1-2 classes	13.15	.557	2, 217		
	3-4 classes	13.37				
	More than 4 classes	12.92				
Phoneme Blending (12)	1-2 classes	11.42	2.365	2, 217		
	3-4 classes	10.90				
	More than 4 classes	11.13				
Word Reading (20)	1-2 classes	15.24	15.262*	2, 217	.1233	2 < 1, 3
	3-4 classes	12.27				
	More than 4 classes	16.81				
Upper case Letter Identification (100)	1-2 classes	98.10	1.270	2, 217		
	3-4 classes	98.20				
	More than 4 classes	99.88				
Lower case Letter Identification (100)	1-2 classes	97.51	1.689	2, 217		
	3-4 classes	97.56				
	More than 4 classes	99.57				
Lower case Sound Identification (100)	1-2 classes	97.19	5.334*	2, 217	.0469	2 < 1, 3
	3-4 classes	93.01				
	More than 4 classes	97.33				

Note. df = degrees of freedom; PC represents pairwise comparisons; 1 = 1-2 classes; 2 = 3-4 classes; 3 = more than 4 classes. Maximum possible score of task in parentheses.

* $p < .05$

Ninety-four percent of teacher participants reported their level of use of LiPS (Lindamood & Lindamood, 1998) methodology for classroom instruction through a four point Likert scale ranging from never to extensively. Fifty-three percent of those responses reported extensive use and represented one category for further analyses. The one category included the 40% who indicated that they modified or adapted the program to meet their needs, and 7% who reported that they use part of the program. Nonparametric correlation revealed a positive correlation with statistical significance for phoneme blending (.152, $p<.05$), and phoneme identity (.174, $p<.01$). Mean scores of students working with teachers who used the program extensively scored higher on the phoneme identity, segmenting, and blending sub-tests as well as upper and lower case letter identification. T-tests indicated statistically significant differences in mean scores on the phoneme identity sub-test [$t (209.768) = -2.584$, $p<.01$, $\eta^2 = .3502$], equal variances not assumed. Scores measured 14.12 (SD = 1.22) out of 15 items for students with teachers who use part of or a modified version of the program, and 14.50 (SD = .91) for students working with teachers who use the LiPS program (Lindamood & Lindamood, 1998) extensively. The minor change in mean score on this sub-test suggested that the statistically significant difference may not be practically significant.

Current teaching assignment was indicated by selecting the category that identified whether the Grade One students were alone, or shared a class with Kindergarten, Grade Two, or was part of a multi-graded classroom. Since only 6% of the sample reported their students were part of a multi-graded setting, that category was collapsed with the 25% of teachers instructing students in a split Grade One/Two class, which totaled 31%. Eight teachers (50%) taught Grade One students in a single-graded

classroom, and 19% of teachers taught both Kindergarten and Grade One. Results from the nonparametric measures revealed significant negative correlations with phoneme blending (-.200, $p<.01$), upper case letter identification (-.180, $p<.01$), and lower case letter identification (-.301, $p<.01$). Analysis of variance indicated a significant statistical difference of mean scores between students of classrooms in a Kindergarten/Grade One combination versus a multi-graded setting on the phoneme blending sub-test [$F(2, 217) = 4.514$, $p<.05$].

4.2.3.2 Instructional Methodology and Student Achievement

Teacher perception was evaluated through nine statements. The first four statements on the teacher survey targeted the instructional methodologies recommended in the LiPS program (Lindamood & Lindamood, 1998) and other best practice research. Teachers were asked to rate their level of knowledge or skill using a four point Likert scale that ranged from no experience to expert. Based on the rate of response and for data analysis purposes, the categories were collapsed into two categories: (a) minimal experience; and (b) extensive experience.

The first two responses produced identical results when the teacher perception data was compared to student achievement. Teachers rated their skill level on instructing the classification of sounds and their use of a multi-sensory approach to learning speech sounds. Group sizes were unequal; 23 student scores were considered in the group with teachers who reported minimal experience, and 197 student scores were considered for the group whose teachers reported extensive experience. As a result, the significant nonparametric correlations and t-tests differences are not considered practical to draw generalizations.

When teachers reported their skill is using concrete objects to assist students in tracking speech sounds, minimal experience included 69 students and extensive experience included 151 subjects. Significant positive correlations resulted from the nonparametric correlation (Spearman R) analysis on two sub-tests. Phonemic blending measured .276 ($p<.01$), and word reading, .140 ($p<.05$). Table 4.9 summarizes mean scores, t-test results, and effect sizes. Although significant differences were not found for the other four sub-tests, the mean scores were all higher in the group of students whose teachers reported extensive experience in their skill in using concrete objects to track speech sounds.

Group sizes varied when teachers reported on their use of questioning as a strategy for helping students understand phoneme and phoneme order. Thirty-two students comprised the group whose teacher reported minimal use, while 188 students were included in the group of teachers who reported extensive use of the questioning strategy. Significant negative correlations and t-test results may have indicated significant differences, but practical significance is limited.

4.2.3.3 Progression Levels and Student Achievement

The last five statements on the teacher survey asked teachers to rate their agreement or disagreement of the importance of the levels of progression outlined as the program components of LiPS (Lindamood & Lindamood, 1998). Distribution of responses required collapsed categories to represent two groups: agreement and disagreement. Even considering the rare statistical significance measured, there is no practical significance of the results because the group sizes were so extreme.

Table 4.9

Comparison of Use of Concrete Objects on Grade One Phonemic Awareness, Word Reading, and Letter/sound Identification Sub-tests

Sub-Test	*Use of Concrete Objects*					
	Minimal (N = 69)		Extensive (N = 151)			
	Mean	SD	Mean	SD	t-Test	ES
Phoneme Identity (15)	14.07	1.20	14.40	1.03	-2.093*	.2962
Phoneme Blending (12)	10.59	1.87	11.47	1.19	-3.580**	.5728
Phoneme Segmenting (15)	12.81	2.75	13.30	2.12	-1.435	
Word Reading (20)	13.86	4.97	15.34	4.84	-2.091*	.3023
Upper Case Letter Identification (%)	97.07	12.59	99.34	2.07	-2.152	
Lower Case Letter Identification (%)	96.57	12.69	98.80	2.40	-2.084	
Lower Case Letter/sound Correspondence (%)	95.01	13.86	96.58	4.86	-1.242	

Note. SD = Standard Deviation; N = sample size; % percentage; ES = effect size.

Maximum possible score of task in parentheses.

* $p < .05$; ** $p < .01$

When teachers reported their agreement or disagreement with letter/sound association, no significant correlations or differences were found. Based on the group size difference of student scores that were used in the analyses, teachers of 11 students disagreed compared to 209 students whose teachers agreed. Group size was also large when teachers reported agreement or disagreement with the importance of using a multi-sensory approach to encouraging children to identify and classify speech sounds, 212 and 8, respectively. The third and fifth statements that targeted tracking speech sounds and recognizing and correcting errors in speech, spelling and reading yielded no results for analyses since all teachers who completed the survey indicated agreement. Therefore, no comparisons were made. When teachers reported their agreement or disagreement with helping students to learn sounds by setting the climate, the sample size of each group varied; 22 students whose teachers disagreed compared to 198 students whose teachers agreed.

Research Question 4

The fourth research question posed was: what is the effect of teachers' perceptions of the LiPS program (Lindamood & Lindamood, 1998) on phonemic awareness skills of *at-risk* Grade One students?

The results of the following analyses were based on a sub-group of the large data set. The 79 students considered in these analyses were those who had been identified as at risk for reading failure based on scores falling below the 25th percentile on any one of the Kindergarten Screening sub-tests. Data analysis of the sub-group deemed at-risk was identical to the procedures used to answer the previous question regarding teacher perception.

4.2.4.1 Teacher Demographics and At –Risk Student Achievement

Nonparametric correlation using Spearman R was run to determine the correlation between teacher experience and student achievement. Results indicated a correlation of .254 ($p<.05$) for the phoneme segmenting sub-test, and a correlation of -.259 ($p<.05$) for the word reading sub-test. A positive correlation indicating that scores of students were higher with less experienced teachers was unexpected. However, further analysis revealed that mean scores of student achievement were higher on five sub-tests when teachers had ten or more years of teaching experience. The tests included: phoneme blending, word reading, sound identification of lower case letters, and upper and lower case letter identification. Significant statistical differences were noted for word reading [$t(77) = 2.022$, $p<.05$, $\eta^2 = .5022$], equal variances assumed. Mean scores of 14.18 (SD = 4.76) in 20 items were ascertained from the group of students who had more experienced teachers as compared to 11.88 (SD = 4.43) for students who had teachers with less experience. The change in mean scores and the medium effect size was indicative of a practical significance.

When evaluating teachers' reading training with student achievement, two significant negative correlations resulted. Sound identification of lower case letters revealed a correlation of -.311 ($p<.01$) but no significant difference existed between the means as analyzed with an ANOVA. Phoneme segmenting produced a stronger correlation of -.407 ($p<.01$) and statistically significant differences in the ANOVA were [$F(2, 76) = 3.129$, $p<.05$, $\eta^2 = .0664$]. The small effect size indicated there was not a practical significance. Differences in mean scores between teachers with four or more classes versus one to two classes were found when harmonic means of the group sizes

were employed. Harmonic means is used to estimate an average group size when the sample sizes in the groups are not equal. It is calculated by dividing the total number of samples by the sum of the reciprocals of the sample sizes. Noteworthy is, although word reading did not yield a significant correlation, the ANOVA revealed a statistical difference [$F (2, 76) = 3.871$, $p<.05$, $\eta^2 = .0924$] between student scores on the sub-test between teachers with three and four classes and more that 4 classes, but the effect size was small.

Specializations were coded as unrelated and related teacher training in the same way as the previous question. Using the nonparametric correlation of Spearman R, data analysis revealed a negative correlation between teacher specializations and student scores on the word reading sub-test (-.319, $p<.01$). Of the seven sub-tests, student's mean scores were higher when working with teachers who had related educational training. However, only word reading scores demonstrated a statistically significant difference with equal variances assumed [$t (77) = 2.555$, $p<.05$, $\eta^2 = .2898$]. Means scores of students with teachers who had related training measured 14.66 (SD = 4.65) and unrelated training, 12.00 (SD = 4.52), indicative of a practical significance.

LiPS (Lindamood & Lindamood, 1998) methodology for classroom instruction was examined using two collapsed groups coded as teachers who used part of or a modified version of the LiPS program (Lindamood & Lindamood, 1998), and those who used the program extensively. Nonparametric correlations that employed Spearman R revealed a statistically significant negative correlation for upper case letter identification (-.298, $p<.01$) and lower case letter identification (-.306, $p<.01$). Although no significant differences were found in the means scores of student's sub-tests, the mean scores of all

three phonemic awareness sub-tests were higher when teachers used the LiPS program (Lindamood & Lindamood, 1998) extensively. When teachers reported partial or modified use of the program, student scores were higher on word reading and all letter/sound identification sub-tests.

Examined results of sub-group designated *at-risk* when considering revealed statistically significant correlations of student achievement in upper case letter identification (-.313, $p<.01$) and lower case sound identification (-.250, $p<.05$). Significant differences were also found in the ANOVA for the same two sub-tests. Due to the extreme group size differences and small effect size, a practical significance is limited.

4.2.4.2 Instructional Methodology and At-Risk Student Achievement

When teacher perception was examined as related to *at-risk* student achievement, results were affected by the sample size. As was the case when teachers reported their skill in instructing students to classify speech sounds and their use of a multi-sensory approach to learning sounds, results were identical. Eight student scores comprised the group who reported minimal experience as compared to 71 student mean scores for the extensive use group. When mean scores were examined, all phonemic awareness and word reading results were higher for those teachers who reported extensive experience in classification of and multi-sensory approach to instructing speech sounds. Even with medium effect sizes, the practical significance was weakened by the vast group size differences.

When the use of concrete objects to track speech sounds was reported by teachers, this sub-set of student scores, designated as *at-risk*, were more equally divided. There

were 24 students that comprised the minimal experience group as compared to 55 who were considered for the group who classified themselves having extensive skill or knowledge. One statistically significant correlation resulted. Phoneme identity scores correlated with reported use and/or knowledge of concrete objects for tracking purposes (.232, $p<.05$). Although mean scores were higher on all sub-tests for the teachers who reported extensive experience, no significant differences between the means resulted.

When teacher skill and knowledge of questioning to help students understand phonemes and phoneme order were reported and measured, the t-test revealed no significant differences between the mean scores of the minimally experienced group and the extensively experienced group. Even though the group size varied, 11 in the minimally experienced group and 68 in the other, the nonparametric correlational analysis revealed one significant correlation with lower case letter identification, -.269 ($p<.05$).

4.2.4.3 Progression Levels and At-Risk Student Achievement

Statistical analyses were affected by group size that examined teacher perception of LiPS levels of progression and the relationship to student achievement of individuals deemed at risk for reading failure. Results were not available for speech sound tracking or error recognition and identification since all teachers reported agreement of importance of these program components. When the results of climate setting were examined, no significant correlation or differences existed between the groups.

Group size varied when student achievement scores in letter/sound association were compared between teachers who agreed (76) and disagreed (3). When analyses were conducted on agreement/disagreement of speech sound identification and

classification, group size varied, 74 to 5, respectively. The practical significance of the results are defused because the of the extreme group size differences.

CHAPTER 5: DISCUSSION

5.1 Summary

5.1.1 Purpose and Procedures

The purpose of this study was to measure the change in phonemic awareness skills of Grade One students compared to their scores from a screening tool administered in Kindergarten. Based on the fact that a measurable change was observed, the second goal was to determine if a relationship existed between teacher perception, demographics, and students' reading improvement in decoding. Observations included students considered typical achievers and students who are considered *at risk*. In order to determine if there was student reading growth, scores from a screening tool administered in Kindergarten (LDWC, 2005) was compared to scores from a Grade One screening tool. The impact of teacher perception and demographics on reading improvement in decoding was correlated with the reading scores on the Grade One screening tool (LDWC, 2002).

5.2 Findings

1. Students demonstrated gains in phonemic awareness and letter/sound correspondence in classrooms where teachers used the LiPS program (Lindamood & Lindamood, 1998).
2. Students considered at risk for reading failure made gains greater than those students who were considered not at risk for reading failure in phonemic

awareness and letter/sound association in classrooms where teachers used the LiPS program (Lindamood & Lindamood, 1998).

3. Teacher demographics, such as experience, specialized training, and program usage may have positively impacted student reading achievement in decoding of students considered *at-risk* and *not at-risk.*

4. Teacher perception did not have a clearly defined relationship with reading achievement in decoding for either *at-risk* or *not at-risk* students.

5.2.1 Reading Achievement in Decoding

The analyses considered raw data of student scores on two phoneme sub-tests, identity and blending. Data was collected on other sub-tests (e.g. rhyming, phoneme segmenting, and word reading) but, since they were not common to both screening assessments, they were not used in the analyses. Letter and sound recognition sub-test results did not use data that measured the actual letters known, but rather raw data was converted to the known percentage of letters/sounds assessed. The purpose of the conversion was due to the need to standardize the scores. In some cases, when data was collected in Kindergarten, some teachers only tested the letters they had directly taught, which may have been less than 26 letters and sounds. Similarly, some Grade One teachers assessed their students extended identification of sounds, specifically the soft /g/ and /c/, which then made 28 sounds.

Analyses revealed significant growth of student achievement on all phonemic and letter/sound recognition sub-tests from Kindergarten to Grade One. Results support the constructs of reading deficit prevention and suggest that the LiPS (Lindamood & Lindamood, 1998) instruction method may have a positive impact on the change in

phonemic awareness skills in Kindergarten and Grade One. However, it is important to recognize other factors that may have influenced performance. These factors include: (1) maturation; (2) desensitization to test taking; and (3) multiple treatment interference, such as the use of other instructional approaches.

Snow et al. (1998) argued that the basic skills of reading include "mapping the letters and the spellings of words onto the sounds and speech units they represent" (p.321). Essentially, the basic skills of reading are defined by phonemic awareness. Phonemic awareness was described by Abbott, Walton, and Greenwood (2002) as the ability to identify, order, and manipulate speech sounds, then link those sounds to written language. The assessment tools that were used demonstrated the need to teach directly, explicitly, and systematically the phonemic awareness and letter/sound recognition skills necessary for students to advance their reading skills toward reading for meaning. Furthermore, the progressive skill development as outlined by Bowman and Treiman (2004) and Scarborough (2001) that have been the foundation of early literacy initiatives, have also been supported by the screening tools developed by McNamara et al. (2005) that were used as measurement instruments for the current research. The inclusion of sub-tests and the increased levels of expectations from Kindergarten to Grade One in the measurement instruments, such as phonemic identity, blending, and segmenting, demonstrated progressive skill development of phonemic and phonological awareness.

The fact that consistently statistically significant gains were made in phonemic awareness and letter/sound association of beginning readers within a year support continued emphasis of directly teaching basic skills that promote early literacy development. Teachers who participated in the study reported using the LiPS program

(Lindamood & Lindamood, 1998) to some extent which is based on the principles of best practice, phonemic awareness development, and letter/sound association.

5.2.2 Reading Achievement in Decoding Group Comparison

As was the case for reading achievement in decoding of the entire student sample, student outcomes in the assessed sub-skills were even greater for students identified at risk for reading failure. Mean scores of at-risk students made not only statistically significant gains in all areas commonly assessed in the Kindergarten and Grade One screening tools, but made greater gains than the students who scored above the 25th percentile on all sub-tests – students considered *not at-risk*. In fact, mean scores on the Grade One screening sub-tests for the *at-risk* students fell within the normal range of scores, which were considered above the 25th percentile. Therefore, even more than typically achieving students, the results of the current study demonstrated support for instructional methods that target phonemic awareness and letter/sound association for those students who demonstrate difficulty in learning to read at a beginning level.

For purposes of this study, the cut-off scores used to designate those students considered at risk for reading failure were based on those reported by McNamara et al. (2005). Their study was specifically related to early identification indicators of reading difficulties. Since the sample size of students scores were larger and extended over several years of data collecting, reliability of those scores are more accurate. However, an analysis of percentiles based on the student scores in the present data set returned similar results on some sub-tests. For example, letter/sound correspondence cut-off was 50%, identical to the results of McNamara et al. (2005), as was the rhyming of phonemes, with the 25th percentile cut-off measuring 14 out of 20 items. Differences existed in the

other four sub-tests. McNamara et al. (2005) suggested the cut-off score for phoneme identity to be 7 out of 15, phoneme blending was 2 out of 8, upper case letter identification was 75%, and lower case letter identification was 65%. The present study revealed that 10 out of 15 correct items on phoneme identity, 3 out of 8 on phoneme blending, 81% of upper case letter identification, and 73% of lower case letter identification were the measures at the 25th percentile based on the present group of student scores.

The congruency of cut-off scores in the current study and the scores reported by McNamara et al. (2005) provide further support for the reliability and validity of the screening tools designed for the longitudinal study. The increased mean scores may indicate that since the early literacy initiative began in the given school jurisdiction, the increased emphasis and support to programming at the Kindergarten level have increased student achievement in the years that followed.

Analyses of scores that designated students at risk for reading failure are further supported by researchers who have suggested that early identification, intervention, and the LiPS (Lindamood & Lindamood, 1998) instructional method are critical in the adoption of best practices. McNamara et al. (2005), Snow et al. (1998), and Vellutino et al. (1996) suggested that early identification of reading difficulties is a means to implementing appropriate prevention and early intervention strategies. These intervention strategies are likely to increase the probability of future reading success for struggling beginning readers (Coyne, Kame'enui, Simmons, & Harn, 2004, Lennon & Slesinski, 1999, Scanlon & Vellutino, 1997).

The LiPS program (Lindamood & Lindamood, 1998) has been effective in developing phonemic awareness, as reported by Torgesen and his research teams, as well as Truch (1994) and Lindamood and Lindamood (1998). Castiglioni-Spalten and Ehri (2003) agreed with Torgesen and Truch, and suggested that the development of these phonological skills have an impact on reading. The results of the current research confirmed their findings. Practitioners and stakeholders must be cognizant that other influential factors may also have contributed to the increase in student performance (i.e., maturation, multiple treatment interference).

It is clear that the practice of this school district and its teachers has substantial data to support their efforts in maintaining best practice and early literacy initiatives. Early identification and intervention of critical reading components, such as phonemic awareness and letter/sound identification, has positively impacted reading achievement in decoding among all Grade One students, but particularly those students who were considered *at-risk* in Kindergarten.

5.2.3 Teacher Data and Reading Achievement in Decoding

When examining the data collected, it was apparent that both student scores and teacher responses were not normally distributed. Student scores were negatively skewed which indicated mastery of phonemic skills and letter/sound recognition. The distribution of teacher responses on the survey was also negatively skewed. Therefore, it was required that nonparametric statistics were employed for results to be most correctly interpreted for the last two research questions. Spearman R is the nonparametric statistic that is equated to the Pearson R. Correlations are calculated based on ranks as opposed to continuous scores. Spearman R reportedly places less stringent demands on the data and

it is more objective when artificial metrics, such as *extensive use* and *strongly agree*, are employed. The issue of non-normality is evident in the t-test and ANOVA. In this study, Levene's Test for Equality of Variance was utilized to verify if equal variance between the two groups could be assumed. The outcome of these employed methods lead to more accurate conclusions to be drawn from the current study.

Caution is required when interpreting the results of analyses that involved the influence of teacher perception and demographic information on student achievement. The self-report survey posed a problem in that teachers may have rated themselves based on a socially acceptable response. Teachers may have reported their responses to the perception statements more highly in order to please the researcher. This resulted in responses where differentiations could not be made. Sample sizes were small for some groups; therefore, comparisons between two groups were extremely uneven.

Results of the current study suggested that more teaching experience, specialized training, and intensity of instructional approach may have a positive impact on student reading outcomes. Teacher knowledge impacted instruction which ultimately, improved student learning as reported by McCutchen, Harry, et al. (2002). Similarly, a link existed between teaching reading effectively and teacher knowledge (Cunningham et al., 2004). Assumptions can be made that teaching experience, specialized training, and training specific to an effective instructional approach, such as LiPS (Lindamood & Lindamood, 1998), contribute to teacher knowledge.

Although it has been suggested that instructional practices have influenced student outcomes, teaching philosophy or beliefs have not been found to predict or impact instructional practices (McCutchen, Harry, et al., 2002). Although the current

study did not employ methods to monitor instructional practice, no conclusions could be drawn on the relationship between student achievement and the teachers reported level of use of and agreement with the LiPS program (Lindamood & Lindamood, 1998).

If instructional practices are known to impact student outcomes, but teaching philosophy has a limited relationship with instructional practices, then it follows that teacher perception may not have a generalized effect on student achievement. The findings reported here support this previous research. In consideration of the statistical cautions already outlined, there was a lack of evidence to determine if a relationship existed and to what extent teacher perception of the LiPS program (Lindamood & Lindamood, 1998) had on student outcomes.

Out of the nine statements on the teacher survey, only one returned results for discussion. Of those teachers who reported proficient or expert use of concrete objects in helping their students understand sound and sound order, student mean scores on all the student achievement sub-tests were higher, three of the seven were statistically significant. One may conclude that effective use of concrete objects does improve student learning of phoneme manipulation and word reading. Research results from Castiglioni-Spalten and Ehri (2003) suggested that instructional methods that include the use of concrete representation of sound prove to be more engaging, and thus transfer to reading skills is maximized. For the students in the research sample, improvement was notable when their teachers reported the use of those concrete objects.

5.2.4 Teacher Data and Reading Achievement in Decoding Group Comparison

As indicated previously, statistical procedure for data analyses of the whole group was repeated for the sub-set of students deemed at risk for reading failure. Due to the

rate of response and distribution of those responses, extreme caution needs to be applied when interpreting the results, since the sample sizes were even more limited than the previous analyses.

Similar to the interpretation of teacher knowledge and perception and student outcomes of the entire student sample, teaching experience and specialized training may have influenced student achievement in phonemic awareness and letter/sound association. Reported perception of the use of concrete objects showed gains made by *at-risk* students, but not significantly.

It would be fair to conclude that limited information can be gleaned from the results of this research that would have practical implications to consider and that limitations of the study were evident. Results from some sections of the research do have practical implications and implications for future exploration.

5.3 Limitations

The first limitations of the study was that data cannot be generalized to other Grade One teachers and their students as it only includes a target sample of teachers and students from one rural school division. The sample size included 36% of the teachers invited to participate, those of which teach in one rural school division located in central Saskatchewan. Since a larger sample is more representative of a population, the small sample size and the distribution of scores limited the scope of generalization.

Second, discretion must be taken when considering the findings that were specifically related to the teacher self-report survey since reliability of the survey was undetermined. The perception items did not appear to clearly identify teachers' level of knowledge or understanding of the LiPS program (Lindamood & Lindamood, 1998).

Observation or interview format data collection would have provided more insightful results. Reported responses may have been influenced by initiatives that were endorsed by the school jurisdiction. Teachers may have reported a higher level of agreement or use because of the expectations of the school division.

Third, other factors such as individual teacher delivery styles and/or use of other instructional methods may affect children's phonemic awareness development. Perceptions of the program were reported, but data regarding instructional practice was not collected. Therefore, monitoring the fidelity of program implementation was not included in the present study.

Fourth, individual students' level of cognitive functioning was an unknown factor that could influence final results of reading skills acquisition. Typically, cognitive deficits are believed to delay learning to read. There were no measures in place to eliminate cases where the level of learning expected for this age would have been inappropriate.

Finally, the fact that the study was not longitudinal, monitoring of transferable skills was restricted. The short term project only allowed measurement of specific sub-skills that are believed to be predictive of reading success. Therefore, one should consider that specific skills may be improved, but that it may not translate into reading achievement within a normal range.

5.4 Conclusion

The current research has explored the impact of LiPS instruction (Lindamood & Lindamood, 1998) and teacher perception on beginning readers. The beginning stages of learning to read can be supported by consideration of the constructs of reading deficit

prevention. That is, by implementing best practice which incorporates key reading components, such as alphabetics, principle instructional practices, and explicit and systematic instruction, teachers can positively impact beginning reading acquisition. Principles of early literacy, identification, and intervention, are critical to preventing reading failure, and are effective in reducing remediation of reading difficulties in the higher grades. A primary skill required by beginning readers is the development of phonemic awareness - the ability to identify and manipulate individual sounds in words.

One instructional program, called LiPS (Lindamood & Lindamood, 1998) incorporates the constructs of reading deficit prevention. The intended outcome of the program is to target phonemic awareness development through five levels of progression, each of which is presented through critical instructional practices. The LiPS program (Lindamood & Lindamood, 1998) is an effective program that has proven to impact beginning reading acquisition.

The questions posed in the present study had determined that phonemic awareness changed from Kindergarten to Grade One, particularly for students at risk of reading failure. However, teacher perception, knowledge, and demographics are also critical factors that impact student achievement. The results of this research contribute to the existing body of research that supports explicit and systematic instruction of phonemic awareness skills at the primary level by well-trained teachers.

5.5 Implications for Practice

In part, this study replicated a study conducted by McNamara et al. (2005). Instruction at a classroom level has proved to be effective in identifying *at-risk* students who received appropriate and timely intervention. As a result, a large percentage of those

students' scores were within a normal range of achievement. Primary prevention at a classroom level appears to be cost-effective and efficient in meeting the needs of students.

Student achievement scores in areas of phonemic awareness and letter/sound correspondence for all students, and particularly those students considered at risk for reading failure, when teachers employed the LiPS program (Lindamood & Lindamood, 1998), made significant gains. The approach to teaching these skills is direct, explicit, and systematic instruction that takes place at the primary reading level. This early literacy initiative has proved to be *best practice* and requires continued support through a variety of regular professional development forums and sustained efforts in data collection. Instructional methods like LiPS (Lindamood & Lindamood, 1998) are effective in identifying those students who struggle learning to read, remediate those difficulties quickly, and then concerted effort can be directed to the percentage of students who truly require secondary and tertiary levels of reading instruction.

The relationship between teaching experience, specified and specialized training, and student reading outcomes has practical implications for district administration. First, as already noted, enhanced professional development specific to instructional approaches need to be financially supported. Second, hiring practices may include the consideration of candidates whose experience and specialized training would impact primary reading achievement and effect positive long term student outcomes.

For primary reading teachers to be adequately prepared to teach students, formal reading training at pre-service and in-service levels needs to be improved and/or maintained. The theoretical underpinnings of reading development are required for

teachers to implement instructional approaches that are effective in teaching children to read.

5.6 Implications for Future Research

There is a limited amount of published research regarding the effectiveness of programs that target phonemic awareness delivered within the context of the classroom. This suggests the need for further carefully designed research to evaluate the efficacy of instructional strategies as it applies to a primary education level. This approach to research would provide opportunities to define differences between treatments. For example, comparisons of student achievement may be made between programs endorsed by different jurisdictions or even varied program adoption with a region. If studied within the context of whole group instruction, research results would include rates of student progress in addition to different treatment effects.

Significant differences did not emerge due to the consistently high ratings of teachers' perception of the LiPS program (Lindamood & Lindamood, 1998). This could be rectified in two ways. First, by increasing the sample size of participating teachers, distributions of responses may be more varied, which would allow for observable relationships between teacher perception and student achievement. Increasing sample size in a replication study may result in finer variations in the responses by teachers that may attain significant differences. Second, by introducing another method of gathering data on perception, such as observation or interview, the research may indicate trends that have practical conclusions that can be drawn for choosing effective instructional approaches or responses needed by district administration in terms of in-service training.

By introducing an observation component, implementation fidelity could be monitored and reflected in student achievement scores.

With the screening tools already developed, acceptable levels of test reliability, and data collection methods established, continued data collation from these instruments would provide data that would extend over a longer period that one year. Continued development of assessment practices that continue to track the progress of students throughout the stages of reading development would provide a wealth of information to inform decisions about best practice, effective instruction, and literacy development.

For those children who continue to struggle beyond the primary prevention level, who did not respond adequately to universal instruction, further research of the effectiveness of LiPS (Lindamood & Lindamood, 1998) delivered at secondary and tertiary levels may be beneficial. If overall progress and/or transferability of skills have not been readily observed, seeking answers to questions regarding the effects of more intensive group instruction and intensive instruction in other settings is recommended. Due to increased emphasis on assessment practices and how assessment can inform teaching and learning, a well designed study that examines the effects of LiPS (Lindamood & Lindamood, 1998) delivered to an *at-risk* population of students, may yield a wealth of practical implications for practice. By targeting the population whose reading skills are not developing at a typical rate, practitioners could explore additional instructional factors that influence learning to read and the rate at which that happens.

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APPENDIX A

GRADE ONE CLASSROOM TEACHER SURVEY FORM

Grade One Classroom Teacher Survey Form

Return to _____

The purpose of this survey is to determine your knowledge, level of skill, and use of the LiPS program. Please check the box that applies to you or fill in the blank.

Teaching experience

☐ 1-3 years ☐ 4-6 years ☐ 7-9 years ☐ More then 10 years

Reading methods training (university classes)

☐ 0 classes ☐ 1-2 classes ☐ 3-4 classes ☐ more than 4 classes

Area(s) of specialization training _____

(Major or minor) _____

Received LiPS training (from Division personnel or outside the division) ☐ Yes ☐ No

Use of LiPS methodology for classroom instruction

☐ Never use ☐ Use part of program ☐ Modified/adapted to meet my needs ☐ Extensively use

Current teaching assignment'

☐ K/Gr.1 ☐ Gr. 1 alone ☐ Gr. 1/2 ☐ Gr. 1 with more than one other grade (i.e. K-Gr. 2, Gr. 1-8)

Select one response to best describe your current knowledge or skill level for each of the four following statements:

Choose your current knowledge or skill-level, based on past success, instructing students on how to classify (label) sounds.

☐ No experience ☐ Minimal experience ☐ Proficient ☐ Expert

Choose your current knowledge or skill-level, based on past success, with instructing students to see, hear, and feel sounds.

☐ No experience ☐ Minimal experience ☐ Proficient ☐ Expert

Choose your current knowledge or skill-level, based on past success, with instructing students on how to use concrete objects to track sounds in words.

☐ No experience ☐ Minimal experience ☐ Proficient ☐ Expert

Choose your current knowledge or skill-level, based on past success, your use of questioning strategy when helping students to understand phonemes and phoneme order.

☐ No experience ☐ Minimal experience ☐ Proficient ☐ Expert

PLEASE SEE OVER

Identify your level of agreement or disagreement in regards to the importance of LiPS program components.

Associating letters with its sounds will rarely help children learn to read.

☐ Strongly disagree ☐ Somewhat disagree ☐ Somewhat agree ☐ Strongly agree

Teachers should encourage students to identify and classify speech sounds using all three senses (i.e. seeing, hearing, and feeling).

☐ Strongly disagree ☐ Somewhat disagree ☐ Somewhat agree ☐ Strongly agree

The tracking of speech sounds is unimportant in teaching children to read.

☐ Strongly disagree ☐ Somewhat disagree ☐ Somewhat agree ☐ Strongly agree

The LiPS process can be used to set the climate in the classroom in order to help students understand how to learn about sounds.

☐ Strongly disagree ☐ Somewhat disagree ☐ Somewhat agree ☐ Strongly agree

Children should be taught to recognize and correct errors in their speech, spelling, and reading.

☐ Strongly disagree ☐ Somewhat disagree ☐ Somewhat agree ☐ Strongly agree

Additional Comments:

APPENDIX B

LETTER OF PERMISSION TO THE

LEARNING DISABILITIIES WORKING COMMITTEE

LETTER OF PERMISSION TO THE
LEARNING DISABILITIIES WORKING COMMITTEE

March 19, 2005

Learning Disabilities Working Committee

Attention to Chairperson: [Insert name]

Re: Permission for Use of Kindergarten and Grade One Screening Manual

Please consider this letter as a formal request to your committee for permission to use the Kindergarten and Grade One Screening Manuals.

I am currently enrolled in a research methods class and may be investigating the impact of a particular teaching strategy on phonemic awareness acquisition. These tools would help me measure the achievement of children who are taught using a particular teaching method.

If you have any questions or require clarification, please feel free to contact me at school (497-2632) or home (497-2437).

Regards,

Susan Protz B. Ed.,

APPENDIX C

LETTER OF APPROVAL FROM THE

LEARNING DISABILITIIES WORKING COMMITTE

LETTER OF APPROVAL FROM THE
LEARNING DISABILITIIES WORKING COMMITTEE

From: Kathy Muttart
To: Susan Protz;
CC:
Subject: Re: LD Working Committee Request
Date: Friday, June 24, 2005 10:59:06 AM
Attachments:
Dear Susan,

RE: Permission for the use of Kindergarten and Grade One Screening Manual

At the May 26th, 2005 meeting of the Learning Disabilities Working Committee this request was approved. It was also suggested that you may be interested in joining the subcommittee which we hope to establish in the fall to work on strategies.

Thank you for your interest.

Kathy Muttart

APPENDIX D

EXCERPT OF

KINDERGARTEN SCREENING TOOL (2005)

KINDERGARTEN SCREENING LEVEL 1 - CLASS PROFILE

SCHOOL:

Student	Birthdate (M/D/Y)	Speech/ Language		Fine/Gross/ Sensory Motor		Phonological Awareness				Letter/Sound Identification				Attention
		Screening Date:		Screening Date:		Screening Date:	Screening Date:	Screening Date:		Screening Date:	Screening Date:	Screening Date:		Screening Date:
		Score out of 17	Level Two Recommended (√)	Score out of 63	Level Two Recommended(√)	Phoneme Identity /15	Rhyming /15	Blending /8	Level Two Recommended(√)	Upper Case ___/___	Lower Case ___/___	Sounds ___/___	Level Two Recommended (√)	Conners' Recommended (√)

Teacher's Signature: _____

Submitted Date: _____

PHONOLOGICAL AWARENESS SCREENING

Student Name:_____ Date: _____
School: _____

I. THE TEST OF PHONEME IDENTITY

(Adapted with permission from "The Test of Phoneme Identities" developed by Murray, B., Smith, K., & Murray, G. (2000)).

Materials: None, other than a copy of this page for reading the items and recording responses.

Directions: The test is administered conversationally. Read with expression but do not emphasize phonemes. Accept any repetition of the sentence that includes the target words, but repeat the sentence if either is incorrect. Require a correct approximation of the isolated phoneme. Repeat the sound-to-word matching question if the response is unclear. To record the answers, mark the child's response as either correct or incorrect.

Say the following to the child.
We're going to play a repeating game. First, I'll say a sentence and then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's try a few.

I will say a sentence. The boy likes the girl. Now I will say /b/. Do I hear /b/ in boy or girl?
I hear /b/ in boy.
Now you try one. Say: He has fun at the park. Now say /p/. Do you hear /p/ in fun or park? Yes.
You hear /p/ in park. Now you can begin on your own.

THE TEST OF PHONEME IDENTITY
(Test Sheet)

	RESPONSE
1. Say: We hid from him. Now say /m/. Do you hear /m/ in hid or him?	____ (him)
2. Say: I race to wash my face. Now say /f/. Do you hear /f/ in face or race?	____ (face)
3. Say: This card game is hard. Now say /h/. Do you hear /h/ in card or hard?	____ (hard)
4. Say: His chin is too thin. Now say /ch/. Do you hear /ch/ in chin or thin?	____ (chin)
5. Say: I brought a scoop to school. Now say /l/. Do you hear /l/ in school or scoop?	____ (school)
6. Say: The cub will come when you call. Now say /b/. Do you hear /b/ in cub or come?	____ (cub)
7. Say: She likes to leap into deep water. Now say /d/. Do you hear /d/ in leap or deep?	____ (deep)
8. Say: In this game, you have a new name. Now say /g/. Do you hear /g/ in game or name?	____ (game)
9. Say: We hate to wait for the bus. Now say /w/. Do you hear /w/ in hate or wait?	____ (wait)
10. Say: This street is straight. Now say /e/. Do you hear /e/ in street or straight?	____ (street)
11. Say: He's the last on the list. Now say /a/. Do you hear /a/ in last or list?	____ (last)
12. Say: Don't cut our kite. Now say /u/. Do you hear /u/ in cut or kite?	____ (cut)
13. Say: Can you move a moose? Now say /v/. Do you hear /v/ in move or moose?	____ (move)
14. Say: The playground is part of the park. Now say /t/. Do you hear /t/ in part or park?	____ (part)
15. Say: The fair is far from school. Now say /ar/. Do you hear /ar/ in fair or far?	____ (far)

RAW SCORE: _____
(out of 15)

II. RHYMING WORDS

Directions for Administration: Ask the child if he or she knows what a rhyme is. Define the concept as, "Words that sound the same at the end." Give several examples such as *cat/hat, man/ran, sandals/candles,* and the child's own name with an appropriate rhyme. Also give counter examples such as *run/green*, and remind the child that these words do not rhyme because *run* ends with *un*, whereas *green* ends with *een*. Then read each pair of words and ask the child to respond with either, "Yes," or "No," to indicate whether or not each word pair rhymes.

1. boy – toy ____ (yes)	9. duck - puck ____ (yes)
2. sun - fun ____ (yes)	10. chick - chip ____ (no)
3. play - ____ (no)	11. tree - truck ____ (no)
game ____ (yes)	12. pig - wig ____ (yes)
4. fat - bat ____ (no)	13. chain - train ____ (yes)
5. man - ____ (no)	14. jog - jack ____ (no)
sad ____ (yes)	15. car - cat ____ (no)
6. red - blue ____ (yes)	
7. bug - rug	
8. log - fog	

RAW SCORE /15

III. PHONEME BLENDING

Directions: Say the following to the child.

I am going to say all the sounds I hear in a word. I want you to tell me the word that you hear when you put these sounds together. You say it fast. Let me show you.

Model: If I say */p/ /i/ /g/* the word is . . . ***pig***

Share: Now try to put the sounds together with me. Say it quickly.
If I say */c/ /a/ /t/* What word do you say? Yes, the word is . . . ***cat***.

Assess: Listen to the sounds and tell me the word those sounds make.

1. g-o _____ (go)	6. p-l-ay _____ (play)
2. d-o-g _____ (dog)	7. n-e-s-t _____ (nest)
3. b-i-g _____ (big)	8. j-u-m-p _____ (jump)
4. f-a-t _____ (fat)	
5. r-u-n _____ (run)	

RAW SCORE /8

Summary of Phonological Awareness Screening Results — Discuss with Resource Teacher

I. The Test of Phoneme Identities _____/15 — Yes _____ No _____
(7 or fewer; discuss with Resource Teacher)

II. Rhyming Words _____/15 — Yes _____ No _____
(7 or fewer; discuss with Resource Teacher)

III. Phoneme Blending _____/8 — Yes_____ No _____
(2 or fewer; discuss with Resource Teacher)

LETTER/SOUND IDENTIFICATION SCORING SHEET

Name: _____ School: _____ Date: _____

Upper Case		Lower Case		
	Letter Name		Letter Name	Sound
B		b		
H		h		
O		o		
J		j		
U		u		
C		c		
Y		y		
A		a		
F		f		
K		k		
P		p		
W		w		
Z		z		
L		l		
Q		q		
M		m		
D		d		
N		n		
S		s		
X		x		
I		i		
E		e		
G		g		
R		r		
V		v		
T		t		
Raw Score				

Scoring Results

Discuss with Resource Teacher:

Upper Case Letter name % = raw score ___ x 100 = _____%
total number taught
*(less than 75%, discuss with resource teacher)

Yes_____ No_____

Lower Case Letter name % = raw score ___ x100= _____%
total number taught
*(less than 65%, discuss with resource teacher)

Yes_____ No_____

Letter Sound % = raw score ___ x 100 = _____%
total number taught
*(less than 50%, discuss with resource teacher)

Yes _____ No_____

APPENDIX E

EXCERPT OF

GRADE ONE SCREENING TOOL (2002)

GRADE ONE SCREEN - CLASS SUMMARY

School

				Phonological Awareness			Word Reading	Letter/Sound Identification		
Student	Student #	Birthdate (M/D/Y)	Sex (Circle appropriate choice)	Phoneme Identity /15	Phoneme Segmenting /15	Phoneme Blending /12	Word Reading ___/20___	Upper Case / 26	Lower Case ___/ 26___	Sounds ___/ 26___
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
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			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							
			Male / Female							

Teacher's Signature: _____ Date: _____

Student Name _____ Date _____ School _____

I. THE TEST OF PHONEME IDENTITY

Materials: None, other than a copy of this page for reading the items and recording responses. The test is administered conversationally. Read with expression. Do not emphasize phonemes. Accept any repetition of the sentence that includes the target words, but repeat the sentence if either is incorrect. Require a correct approximation of the isolated phoneme. Repeat the sound-to-word matching question if the response is unclear. To record the answers, mark the child's response either correct or incorrect. For the Test of Phoneme Identity, **administer all items.**

Directions: We're going to play a repeating game. First, I'll say a sentence, then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's try a few.

Model: I will say a sentence. ***The boy likes the girl.*** Now I will say /*b*/. Do I hear /*b*/ in ***boy*** or ***girl***? **(I hear /b/ in boy).**
Share: Now you try one. Say: ***He has fun at the park.*** Now say /*p*/. Do you hear /*p*/ in ***fun*** or ***park***? Yes. You hear /*p*/ in ***park.***
Assess: Now you can begin on your own.

Scoring Notes to Teachers: If a student cannot repeat the entire sentence correctly but does repeat the target words correctly, continue to test their knowledge of the target words. If a student repeats the target words incorrectly, you should repeat the sentence and have them try it again. If after two times the student cannot correctly repeat the target words, attempt to ask the question about hearing the sound. If a student provides an incorrect answer, mark it as incorrect and proceed to the next item. You should not be concerned with articulation errors.

	Response	
1. Say: His chin is too thin. Now say /ch/. Do you hear /ch/ in chin or thin?	_____	(chin)
2. Say: I brought a scoop to school. Now say /l/. Do you hear /l/ in school or scoop?	_____	(school)
3. Say: Would you share a pair of socks? Now say /p/. Do you hear /p/ in share or pair?	_____	(pair)
4. Say: The cub will come when you call. Now say /b/. Do you hear /b/ in cub or come?	_____	(cub)
5. Say: She likes to leap into deep water. Now say /d/. Do you hear /d/ in leap or deep?	_____	(deep)
6. Say: In this game, you have a new name. Now say /g/. Do you hear /g/ in game or name?	_____	(game)
7. Say: We hate to wait for the bus. Now say /w/. Do you hear /w/ in hate or wait?	_____	(wait)
8. Say: This street is straight. Now say /ee/. Do you hear /ee/ in street or straight?	_____	(street)
9. Say: He's the last on the list. Now say /a/. Do you hear /a/ in last or list?	_____	(last)
10. Say: On Halloween bring a big bag. Now say /i/. Do you hear /i/ in big or bag?	_____	(big)
11. Say: Don't cut our kite. Now say /u/. Do you hear /u/ in cut or kite?	_____	(cut)
12. Say: John was third and Lucy was first. Now say /f/. Do you hear /f/ in first or third?	_____	(first)
13. Say: The square fit the best. Now say /i/. Do you hear /i/ in fit or best?	_____	(fit)
14. Say: The boy was very thirsty. Now say /v/. Do you hear /v/ in very or thirsty?	_____	(very)
15. Say: Dawn fell down. Now say /ow/. Do you hear /ow/ in dawn or down?	_____	(down)

RAW SCORE (out of 15) _____

Student Name _____ Date _____ School _____

II. PHONEME BLENDING

Directions: I am going to say all the sounds I hear in a word. I want you to tell me the word that you hear when you put these sounds together. You say it fast. Let me show you (say sounds at interval of 1-second apart).

Model: If I say */p/ /i/ /g/* the word is . . . ***pig***

Share: Now try to put the sounds together with me. Say it fast. If I say */c/ /a/ /t/*, what word do you say? Yes, the word is . . . ***cat***. If student is incorrect, provide correct feedback (only for model question).

Assess: Listen to the sounds and tell me the word those sounds make.

Scoring Note to Teachers: In order to be scored correct, students must pronounce the word correctly. Discontinue testing after student scores **4 consecutive incorrect** responses. Students' total raw score will reflect the number of correct responses. Upon request of the student you may repeat the sounds once.

		Response
1.	g-o (go)	_____
2.	d-o-g (dog)	_____
3.	b-i-g (big)	_____
4.	f-a-t (fat)	_____
5.	r-u-n (run)	_____
6.	p-l-ay (play)	_____
7.	n-e-s-t (nest)	_____
8.	j-u-m-p (jump)	_____
9.	s-t-a-m-p (stamp)	_____
10.	s-m-i-le (smile)	_____
11.	g-ar-d-e-n (garden)	_____
12.	d-o-c-t-or("er") (doctor)	_____

RAW SCORE (out of 12) _____

Student Name _____ Date _____ School _____

III. PHONEME SEGMENTING

Directions: I am going to say a word and I want you to repeat the word. Then I want you to tell me each sound you hear in the word. Let's try one.

Model: Say the word ***dog*** (dog). Now I am going to say the sounds in dog, listen carefully ***/d/ /o/ /g/.*** The word is . . . ***dog.*** Good now you try one.

Share: Say ***mat (mat).*** Now say the sounds in ***mat (/m/ /a/ /t/)*** If the student is incorrect, provide her/him with the correct sounds.

Assess: Now I want you to try some on your own. Let's begin.

Scoring Note to Teachers: In order to be scored correct, students must segment each sound correctly. Discontinue testing after student scores **4 consecutive incorrect** responses. Students' total raw score will reflect the number of correct responses.

		Response
1.	to (t-o)	_____
2.	up (u-p)	_____
3.	cat (c-a-t)	_____
4.	lid (l-i-d)	_____
5.	red (r-e-d)	_____
6.	sun (s-u-n)	_____
7.	keep (k-ee-p)	_____
8.	line (l-i-ne)	_____
9.	mice (m-i-ce)	_____
10.	that (th-a-t)	_____
11.	truck (t-r-u-ck)	_____
12.	first (f-ir-s-t)	_____
13.	grape (g-r-a-pe)	_____
14.	thunder (th-u-n-d-er)	_____
15.	school (s-ch-oo-l)	_____

RAW SCORE (out of 15) _____

Student Name _____ Date _____ School _____

IV. WORD READING

Directions: I am going to show you a list of words and I want you to read the words. Try to read the words as quickly as you can.

Model: If I show you the word ***cat,*** then you tell me what this word says (cat). Let's try one.
Practice: If I show you this word ***hot,*** what does the word say? Let's begin.
Assess: Look at these words and tell me what they say.

Scoring Note to Teachers: For this test administer all items. In order to be scored correct, students should read words without spending too much time sounding out each phoneme. If a student does not respond correctly within 3 seconds, score as incorrect. If student does not know the word after 3 seconds, mark as incorrect and you may provide corrective feedback (corrective feedback is not part of the assessment).

		Response
1.	go	_____
2.	up	_____
3.	him	_____
4.	look	_____
5.	tree	_____
6.	want	_____
7.	frog	_____
8.	milk	_____
9.	road	_____
10.	egg	_____
11.	ride	_____
12.	game	_____
13.	bump	_____
14.	puppy	_____
15.	flower	_____
16.	breakfast	_____
17.	picture	_____
18.	something	_____
19.	suddenly	_____
20.	thirsty	_____

RAW SCORE (out of 20) _____

Student Name _____ Date _____ School _____

V. LETTER IDENTIFICATION

Directions: Ask students to give you the name of each Upper Case and Lower Case letter. If student cannot name the letter, mark as incorrect and proceed to the next letter. After completing the letter naming task, ask students to look at the Lower Case letter and give you the sound of each letter. Mark as correct if student provides the sound that you have been teaching in class. Most likely this will be the hard letter sound (e.g. "c" as in "cat"). If student gives you the "soft" sound (e.g. "c" as in "ice"), ask if they can think of another sound for this letter. If student does not respond with hard sound, mark as incorrect. In the same respect, when assessing vowels look for the short vowel sound. When assessing letter sound use the lower case letters.

Scoring Note to Teachers: Please test all 26 letters for each of the Upper Case and Lower Case letters as well as Letter Sounds. Students' raw scores should be Number Correct out of 26.

Upper Case		**Lower Case**		
	Letter Name		**Letter Name**	**Sound**
A		a		
F		f		
K		k		
P		p		
W		w		
Z		z		
B		b		
H		h		
O		o		
J		j		
U		u		
C		c		
Y		y		
I		l		
Q		q		
M		m		
D		d		
N		n		
S		s		
X		x		
I		i		
E		e		
G		g		
R		r		
V		v		
T		t		
Raw Score (/ 26)	____ / 26		____ / 26	____ / 26

APPENDIX F

LETTER INDICATING SUPPORT FOR RESEARCH

LETTER INDICATING SUPPORT FOR RESEARCH

October 11, 2005

TO WHOM IT MAY CONCERN:

Re: Susan Protz

Please consider this letter approval from School Division for our employee, Susan Protz, to conduct research on LIPS. As this is one of the strategies we endorse in our early literacy programming, we always appreciate receiving any additional information on LIPS that may assist us in making this program as effective as possible.

The Board of Education supports Susan's thesis topic, in general, but we will require additional details regarding the project as they become available to Susan.

We look forward to seeing the results of Susan's research. If you require any further information, please feel fee to contact me at .

Sincerely,

APPENDIX G

STUDENT APPLICATION FOR

APPROVAL OF A RESEARCH PROTOCOL

TO THE OFFICE OF RESEARCH SERVICES

UNIVERSITY OF SASKATCHEWAN

University of Saskatchewan
Student Application for Approval of a Research Protocol

Information Required:

1. **Name of researcher(s)** and/or supervisor (s) and related department(s).

1a. **Name of student(s)**, if a student study, and type of study (e.g., B.A., Hon., M.A., Ph.D.)

Student: Susan Protz
Masters Candidate
Department of Educational Psychology and Special Education
College of Education
University of Saskatchewan

Type of Study: Masters Thesis – M. Ed.

1b. Anticipated start date of the research study (phase) and the expected completion date of the study (phase).

Project Deadlines:
Starting date (yy/mm/dd): 06/02/20 Ending date (yy/mm/dd): 06/09/30

2. Title of Study

Project Title: *The Impact of LiPS Instruction and Teacher Perception on Beginning Readers*

3. Abstract (100-250 words)
Provide a brief statement of the hypotheses to be examined.

The purpose of this study is to: 1) determine the effectiveness of the LiPS (Lindamood Phoneme Sequencing) program in improving phonemic awareness skills for first grade students; and 2) determine if there is a relationship between reading improvement and teacher perception of their knowledge of the LiPS program. Students' scores on the Kindergarten screening tool (Saskatoon East, Saskatoon West, and Saskatchewan Valley School Divisions' Learning Disabilities Working Committee, 2005) will be compared to their respective scores on a Grade One screening tool. Comparison of progress for all students will be evaluated and assessment of progress for students deemed at risk of reading failure (scores that indicate phonological processing is below the 25th percentile) will be compared. Data gleaned from the teacher perception survey, intended to examine the critical elements of the LiPS program as well as gather demographic information, will be correlated to student outcomes. This study will strive to perform a descriptive function that monitors change in phonemic awareness of children within a year and will

investigate the relationship between teacher perception of their knowledge of the LiPS program and student outcomes.

This study will investigate the following research questions: 1) Do the phonemic awareness skills of Grade One students change from Kindergarten when their teachers have implemented the LiPS program? If so, to what extent? 2) Do teachers' perceptions of the LiPS program influence phonemic awareness of Grade One students? If so, to what extent? These questions will be repeated when examining Grade One students functioning below the 25th percentile in phonological awareness.

4. Funding

Indicate the source of funds supporting the research.

Not applicable. The graduate student will fund the research.

5. Expertise

Not applicable. No special or vulnerable populations are involved in this study.

6. Conflict of Interest

The relationship between the researcher and participants is collegial, as fellow employees of the school jurisdiction where the data will be collected. No financial benefits will accrue for recruiting participants or conducting the research. No foreseen limits exist on the publication or distribution of findings.

No relationship exists between the researcher and students in the classrooms of potential teacher participants.

7. Participants

Describe the procedures for recruiting, selecting and assigning participants.

There are two main issues of concern to the committee:

a) the potential for coercion that arises.
b) a possible loss of privacy or anonymity.

Approximately 35 to 40 classroom teachers of first grade students in one school jurisdiction will be recruited to participate in this study. Upon School Division Board approval and informational correspondence provided to in-school administrators, a letter of invitation to Grade One teachers will be distributed through interoffice mail. A written description of the study and the researcher's contact information will be included with the letter. Those teachers who volunteer will sign a consent form, complete a 14-item survey, and submit raw data from the screening tools administered to their students when in Kindergarten and Grade One. Volunteers for the study will return required coded forms (consent form, teacher perception survey, and raw data profile sheets) to the division office to eliminate a release of identifying information of students and teachers

to the researcher. A position of power between the researcher and participants does not exist.

As a minimal risk project, only aggregate data will be used when analyzing student outcomes. No identifying information of the students in the classrooms of potential participants will be collected. Students will be assigned a code, linked to their respective classroom teacher, to ensure confidentiality. Parents will be informed of the intended research and will have the option of excluding their child's scores from the study.

The teaching strategies and assessment practices have been routines adopted by teachers in this school jurisdiction over the last five years, therefore no new treatment condition is being applied for this study. All students receive the instruction and assessment protocol as part of the program delivery.

Background questions have been incorporated into the perception questionnaire to identify teacher level/independent variables (i.e., years of practice, level and type of education/in-service training). The confidentiality of all information gathered from participants will be ensured. All responses obtained from participants will remain confidential. Responses on any materials associated with the study will be identified by a code number and not by name. That is, prior to the analysis of their responses on the teacher survey and student summary sheet, names will be removed and replaced with a code number that will link the potential participants with their respective students. Any documentation identifying the individual by name and their assigned code number will be kept separate from their responses.

7a. Letters of invitation should provide the following information:

1. Clear statement that the project is a research study.
2. Name and contact information of the researcher.
3. Procedures of the study and what is expected of the participant.
4. Amount of time required to participate.
5. The following standard statement, "If you are interested in learning more about this study, please contact X and more details will be provided".
6. REB approval and contact information statement.

Refer to Appendix A: Participant Information Letter

Informational Correspondence to Principals

8. <u>Consent</u>

In addition, the committee requests that researchers describe:

1. The process by which participants consent to participate in the research project.
2. The procedures that will be in place to ensure timely opportunities to give or withdraw consent.

The researcher will present a letter of invitation (Appendix A) that includes a description of the study to potential participants. At that time, a written consent form will be provided to volunteer participants to endorse. The letter and consent form describing the project informs participants of their rights.

Refer to Appendix B: Copy of Participant Information and Consent Form

Participants' involvement in this study consists of spending approximately 15 minutes completing a written questionnaire. A letter of invitation to participate is provided outlining contact information (e-mail and telephone number) of both the researcher and her supervisor. This ensures participants are able to contact the researcher at any time with questions, concerns, or to inform the researcher that they wish to withdraw consent to participate within the duration of this study.

Consider whether any of the following concerns apply:

a) Alternative consent protocols

The completion of the survey by teachers on its own is not being considered to mean consent to participate has been given. Teacher participants will be asked to sign a written consent to participate. This method is not considered to be impractical, since teachers are the subjects being recruited to participate. Therefore, concerns such as ability of subjects to read and understand the form will not be an issue.

b) Recruitment from organizations

A letter of support for the proposed project before preliminary thesis proposal began was provided by the researcher's employing school jurisdiction.

Refer to Appendix C: Letter Indicating Support for Research

Once ethics approval has been obtained, the school division's Board of Education will receive a letter of intent. The letter will seek permission to survey Grade One teachers and access data reporting their student outcomes from the screening tools.

Refer to Appendix D: Letter of Intent to School Division

c) Children under 18 years of age

Even though no treatment condition exists, parents/guardians of students in the classroom of teachers who volunteer to participate will be informed of the intended research project

and their rights will be outlined. Contact information will be provided and procedures for ensuring confidentiality will be explained. Their right to refuse their child's scores be included in the study will be stated.

In this minimal risk study, students in the classrooms of potential teacher participants are receiving programming and assessment protocols that exist within the standard practices supported by the school division throughout the last five years. Parents will be informed of their right to have their child's scores withdrawn from the aggregated data for this research. Teacher participants may choose to exclude students who do not have the capacity to participate within the instructional setting or assessment procedures. For example, a child who is cognitively impaired or is not proficient in the English language may be excluded.

Refer of Appendix E: Copy of Parent/Guardian Information Letter

d) Participants are in a dependent relationship to the researcher

The researcher's relationship with potential participants is collegial; no power relationship exists. As previously indicated, the invitation to participate in the form of a letter and delivered by inter-office mail helps to alleviate a feeling of coercion by potential participants.

e) Participants are not able to given either consent or assent

Not applicable. The researcher does not foresee any participants not being able to give written consent.

f) Participant-Observation research

Not applicable. Participant-observation or naturalistic-observation research is not being conducted.

g) Research involving small groups

As already indicated, parents/guardians will be provided with information about the study that outlines their rights in a letter. The names of children will be replaced with a code that corresponds to their teachers' code. Therefore, methods of identifying individual students will be eliminated. Withdrawal of a small number of students will not jeopardize the entire project.

9. <u>Methods/Procedures</u>

Describe the procedures to obtain research data.

Teacher surveys will be distributed by inter-office mail with *Participant Information Letter* and *Participant Information and Consent Form* addressed to the Grade One

Teacher(s). Upon completion, surveys will be returned in an envelope via inter-office mail.

Refer to Appendix F: Copy of Grade One Classroom Teacher Survey Form

In May, teachers will be provided with a Grade One Class Summary Profile Sheet through inter-office mail or e-mail, and volunteering teachers will return a copy to Division Office using inter-office mail. At that time, the researcher will collect student assessment data from each of the Kindergarten Screening tool and the Grade One Screening tool after a code number has been assigned and student names are removed. Arbitrary identification codes will be used that will not allow the identification of individual participants (teachers or students).

Refer to Appendix G: Kindergarten Screening Level 1 – Class Profile
Kindergarten Screening Tool (2005)

Refer to Appendix H: Grade One Screening - Class Summary
Grade One Screening Tool

10. Storage of Data

Upon completion of the study, all data will be securely stored and retained by the researchers' graduate supervisor, Dr. Laureen McIntyre, Department of Educational Psychology and Special Education in the College of Education in accordance with the guidelines defined by the University of Saskatchewan. The data will be placed in a locked cabinet for a minimum of five years.

11. Dissemination of Results

Results from this project will be used for my thesis, scientific publications, and presentations to professionals, parents, and educators. The confidentiality of all information gathered from participants will be ensured. All responses obtained from participants will remain confidential.

12. Risk, Benefits, and Deception

This research will provide information to educators regarding the effectiveness of an instructional strategy that is designed to help children learn to read.

No perceived risk or deception is involved in this study. Participants will not be exposed to harm, discomforts, or perceived harm. Potential participant names will be removed and replaced with a code number. Therefore, there is limited opportunity for loss of privacy, confidentiality, or anonymity even though the researcher was able to identify potential participants in advance of their consent to participate.

When assessing the degree of risk entailed by your procedure, please consider the following questions:

a) Are you planning to study a vulnerable population?

No.

b) Are you planning to study a captive or dependent population, such as children or prisoners?

No. Aggregated scores from the assessment tools used to interpret specific reading skills of students will be examined in relation to teacher perceptions of an instructional strategy. These instructional and assessment strategies have been available to teachers and administered to students in the school jurisdiction for five years, so no new treatment condition exists.

c) Is there is a institutional/ power relationship between researcher and participant?

No. As indicated previously, an employee/employee affiliation exists, but no power relationship is present.

d) Will it be possible to associate specific information in your data file with specific participants?

No.

e) Is there a possibility that third parties may be exposed to loss of confidentiality/ anonymity?

No.

f) Are you using audio or videotaping?

No.

g) Will participants be actively deceived or misled?

No.

h) Are the research procedures likely to cause any degree of discomfort, fatigue, or stress?

No. The participating educators already adopt the procedures under study.

i) Do you plan to ask participants questions that are personal or sensitive? Are there questions that might be upsetting to the respondent?

No.

j) Are the procedures likely to induce embarrassment, humiliation, lowered self-esteem, guilt, conflict, anger, distress, or any other negative emotional state?

No.

k) Is there any social risk?

No.

l) Will the research infringe on the rights of participants by, for example, withholding beneficial treatment in control groups, restricting access to education or treatment?

No. All participants will have equal opportunity to benefit from the results of the research through debriefing.

m) Will participants receive compensation of any type? Is the degree of compensation sufficient to act as a coercion to participate?

No compensation of any type will be provided.

n) Can you think of any other possible harm that participants might experience as a result of participating in this study?

No.

13. Confidentiality

As previously mentioned, a pool of potential participants will be approached to participate in this study. All participant surveys will be assigned a code prior to analysis and collected in unmarked envelopes. The code will consist of digits representing school number, a teacher number, and a student number. For example, in '1403', the first two digits will designate the school, and the second two digits will designate the teacher. Two more digits will be added to represent each student in the classroom of the teacher participant on the summary sheets of the screening tools. The data link will be destroyed upon completion of the study. Data will only be reported in aggregate form. A pseudonym for the school division will be used. Therefore, there is limited opportunity for loss of privacy or anonymity even though the researcher was able to identify potential participants in advance of their consent to participate.

14. Data/Transcript Release

Not applicable.

15. Debriefing and feedback

Participants are provided with information on how the researcher can be contacted if they have questions or concerns in the letter of information describing the study they received. All participants will be informed about the public access to the finished study at the University of Saskatchewan. A copy will be deposited at the University of Saskatchewan library. A copy of the study will also be provided to the school division. A brief executive summary of the project will be provided to each of the participants upon request.

16. **Required Signatures**

(1) Student Signature

Susan J. Protz
Masters Candidate
Department of Educational Psychology and Special Education
University of Saskatchewan

(2) Supervisor Signature

Dr. Laureen McIntyre
Department of Educational Psychology and Special Education
University of Saskatchewan

(3) Acting Department Head Signature

Dr. Sam Robinson
Department of Educational Psychology and Special Education
University of Saskatchewan

17. Contact Name and Information

(1) Student Contact Information

Susan J. Protz	E-mail Address:	sprotz@sasktel.net
Masters Candidate	Telephone:	(306) 497-2437
Department of Educational Psychology and Special Education	Mailing Address:	Box 356 Blaine Lake, SK S0J 0J0
University of Saskatchewan	Fax:	Not Applicable

(2) Supervisor Contact Information

Dr. Laureen McIntyre	E-mail Address:	laureen.mcintyre@usask.ca
Assistant Professor	Telephone:	(306) 966-5266
Department of Educational Psychology and Special Education	Mailing Address:	28 Campus Drive College of Education
University of Saskatchewan		University of Saskatchewan Saskatoon, SK S7N 0X1
	Fax:	(306) 966-7719

(3) Acting Department Head Contact Information

Dr. Sam Robinson	E-mail Address:	sam.robinson@usask.ca
Acting Department Head	Telephone:	(306) 966-7577
Department of Educational Psychology and Special Education	Mailing Address:	28 Campus Drive College of Education
University of Saskatchewan		University of Saskatchewan Saskatoon, SK S7N 0X1
	Fax:	(306) 966-7719

APPENDIX H

BEHAVIORAL RESEARCH ETHICS BOARD

CERTIFICATE OF APPROVAL

University of Saskatchewan
Behavioural Research Ethics Board (Beh-REB)

13-Apr-2006

Certificate of Approval

PRINCIPAL INVESTIGATOR
Laureen McIntyre

DEPARTMENT
Educational Psychology and Special Education

BEH#
06-39

STUDENT RESEARCHER(S)
Susan Protz

INSTITUTION (S) WHERE RESEARCH WILL BE CARRIED OUT
University of Saskatchewan
Saskatoon SK

SPONSORING AGENCIES
UNFUNDED

TITLE
The Impact of LiPS Instruction and Teacher Perception on Beginning Readers

CURRENT APPROVAL DATE
13-Apr-2006

CURRENT RENEWAL DATE
01-Apr-2007

CERTIFICATION
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
The term of this approval is five years. However, the approval must be renewed on an annual basis. In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions:
http://www.usask.ca/research/ethical.shtml .
APPROVED.

Valerie Thompson, Chair
Behavioural Research Ethics Board
University of Saskatchewan

Please send all correspondence to:

Ethics Office
University of Saskatchewan
Room 306, Kirk Hall, 117 Science Place
Saskatoon, SK S7N 5C8
Phone: (306) 966-2084 Fax: (306) 966-2069

APPENDIX I

LETTER OF INTENT TO THE SCHOOL DIVISION

LETTER OF INTENT TO THE SCHOOL DIVISION

April 13, 2006

Dear Ms. _____ and _____,

RE: Permission to Survey School Teachers and Analyze Student Assessment Data

I am a master's student in the Department of Educational Psychology and Special Education at the University of Saskatchewan supervised by Dr. Laureen McIntyre. As part of the requirements for the completion of my master's degree, I am conducting a research project to explore student growth in phonemic awareness, teacher perception of the Lindamood Phoneme Sequencing (LiPS) instructional strategy, and determine if there is a relationship between reading improvement and teacher perception in their use of a specific instructional strategy. The project is entitled, "The Impact of LiPS Instruction and Teacher Perception on Beginning Readers".

I am requesting permission to survey Grade One teachers in your school division. Those teachers will be invited to voluntarily participate by completing a 15-minute survey of their perceptions in regards to an instructional strategy that has been supported through in-service training by this school division. I would like to conduct the survey during April/May, 2006. Potential participants will be asked to complete the Grade One Screening Classroom profile sheet that provides assessment data on their students' phonological awareness and these results will be analyzed in comparison to their corresponding Kindergarten screening scores. These raw scores will serve as the data used in the statistical analyses on which the results and discussion of this study will be based. I am requesting that letters of consent and survey responses be collected at the division office so that ethical procedures are maintained to ensure confidentiality of teachers and students.

Please find enclosed copies of all correspondence to teachers, principals, and parents. If you require further information, please feel free to contact me at home (497-2437) or by e-mail (sprotz@sasktel.net). The University of Saskatchewan Behavioral Research Ethics Board (Beh-REB) has approved this study on April 13, 2006. Any questions regarding participant rights may be addressed to the Office of Research Services (966-2084). I look forward to hearing from you.

Respectfully yours,

Susan Protz
Masters Candidate
Department of Educational Psychology and Special Education
University of Saskatchewan

APPENDIX J

PARTICIPANT INFORMATION LETTER

PARTICIPANT INFORMATION LETTER

Susan J. Protz
Masters Candidate
Box 356
Blaine Lake, SK S0J 0J0

May 1, 2006

Dear Participant:

I am a master's student in the Department of Educational Psychology and Special Education at the University of Saskatchewan supervised by Dr. Laureen McIntyre. As part of the requirements for the completion of my masters degree, I am conducting a research project to explore student growth in phonemic awareness, teacher perception of the Lindamood Phoneme Sequencing (LiPS) instructional strategy, and determine if there is a relationship between reading improvement and teacher perception in their use of a specific instructional strategy. This information may benefit classroom teachers in pinpointing instructional techniques that are beneficial to students who are learning to read. There are no known risks of this research study.

All Grade One teachers employed by _____ will be invited to participate in this project. Participants will be asked to distribute the Parent/Guardian Information Letter and complete a perception survey that addresses their understanding the key components of the LiPS program and degree of importance of each critical feature. The survey will take approximately **15 minutes** to complete. In May, after teachers administer the Grade One screening assessments that examines student outcomes in phonological awareness and beginning reading skills, volunteer teachers will complete the student summary sheet developed by the division office. This tool is currently available to all Grade One teachers to assist with instructional programming and student assessment. These raw scores will serve as the data used in the statistical analyses on which the results and discussion of this study will be based.

The information gathered from teachers who participate in this study will be used for my thesis, scientific publications, and presentations to professionals, parents, and educators. The confidentiality of all information gathered from participants will be ensured. All responses obtained from you will remain confidential. Responses on any material associated with the study will be identified by a code number and not by name, and a pseudonym will be used when referring to the school division. Data from this study will be kept for at least five years by my supervisor. Participation is completely voluntary, and you may wish to withdraw from the study at any time.

Your cooperation in completing this portion of my project would be greatly appreciated. If you are interested in participating, please fill in the attached consent form, complete the enclosed questionnaire, and distribute the Parent/Guardian Information Letter for each of

your students. Please seal your completed forms and return it to _____ through inter-office mail. In two weeks, I will collect the separately sorted forms, to ensure confidentiality and privacy. Before May 26, 2006, please submit a completed Grade One Student Summary Sheet to _____ through inter-office mail. Student names will be removed and replaced by a code before analysis begins.

The survey has been approved by your Board of Education on April 19, 2006. In addition, this research has been granted approval by the Office of Research Services at the University of Saskatchewan on April 13, 2006. Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084).

If you have any questions or concerns about this study, I can be contacted by e-mail at sprotz@sasktel.net, or at my home phone number (497-2437). You may also contact my research supervisor, laureen.mcintyre@usask.ca for more information. If after participating in this study you are interested in the results, a brief executive summary will be available upon request.

Thank you, in advance, for your consideration and cooperation in participating in this project.

Respectfully yours,

Susan Protz, B. Ed.
Masters Candidate
Department of Educational Psychology and Special Education
University of Saskatchewan

APPENDIX K

INFORMATIONAL CORRESPONDENCE

TO PRINCIPALS

INFORMATIONAL CORRESPONCENCE TO PRINCIPALS

Susan J. Protz
Masters Candidate
Box 356
Blaine Lake, SK S0J 0J0

May 1, 2006

Dear Administrator:

I am a master's student in the Department of Educational Psychology and Special Education at the University of Saskatchewan supervised by Dr. Laureen McIntyre. As part of the requirements for the completion of my masters degree, I am conducting a research project to explore student growth in phonemic awareness, teacher perception of the Lindamood Phoneme Sequencing (LiPS) instructional strategy, and determine if there is a relationship between reading improvement and teacher perception in their use of a specific instructional strategy. The project is entitled, "The Impact of LiPS Instruction and Teacher Perception on Beginning Readers".

All Grade One teachers employed by _____ will be invited to participate in this project. Participants will be asked to distribute the Parent/Guardian Information Letter and complete a perception survey. In May, after teachers administer the Grade One screening assessments that examines student outcomes in phonological awareness and beginning reading skills, volunteer teachers will complete the student summary sheet developed by the division office. This tool is currently available to all Grade One teachers to assist with instructional programming and student assessment. These raw scores will serve as the data used in the statistical analyses on which the results and discussion of this study will be based.

The confidentiality of all information gathered from participants will be ensured, participation is voluntary, and teachers may withdraw from the study at any time without penalty. All individuals and schools who participate in this study will remain confidential and a pseudonym will be used when referring to the school division.

Consent forms and teacher surveys will be returned through inter-office mail to _____, which I will collect in two weeks. The Grade One Student Summary Sheet containing raw assessment data will be collected in the same manner by May 26, 2006.

The survey has been approved by your Board of Education on April 19, 2006. In addition, this research has been granted approval by the Office of Research Services at the University of Saskatchewan on April 13, 2006. Any questions regarding rights as a participant may be addressed to that committee through the Office of Research Services (966-2084).

If you have any questions or concerns about this study, I can be contacted by e-mail at sprotz@sasktel.net or at my home phone number (497-2437). You may also contact my research supervisor, Dr. Laureen McIntyre, at laureen.mcintyre@usask.ca, for more information. If you are interested in the results of this study, a brief executive summary will be available upon request.

Thank you, in advance, for your interest in this project.

Respectfully yours,

Susan Protz, B. Ed.
Masters Candidate
Department of Educational Psychology and Special Education
University of Saskatchewan

APPENDIX L

TEACHER CONSENT FORM

TEACHER CONSENT FORM

Title of Study:
The Impact of LiPS Instruction and Teacher Perception on Beginning Readers

Researcher and Supervisor:
Susan Protz, Master of Education candidate in the Department of Educational Psychology and Special Education at the University of Saskatchewan.
E-mail: sprotz@sasktel.net
Home Telephone: 497-2437

Dr. Laureen McIntyre, Assistant Professor, Department of Educational Psychology and Special Education, University of Saskatchewan.
E-mail: laureen.mcintyre@usask.ca
Office Telephone: 966-5266

Purpose of the Study:
You are invited to participate in a study, the purpose of which is to survey teacher's perceptions of an instructional program designed to help improve students' phonological awareness and determine if a relationship exists between your perceptions and student outcomes. This information will be used to determine effective instructional practices and its possible connection to student learning. The information may benefit classroom teachers in helping to determine effective in-service support and pinpoint instructional techniques that are beneficial to students who are learning to read. There are no known risks in this research study. The results will be used for this research thesis, scientific publications, and presentations to teachers, parents, and professionals. Only aggregate data will be reported. Therefore, it will not be possible to identify any individual participants in any documents resulting from this research.

As a participant in this study:
1. You are provided with an invitational letter to participate in this study that provides project information, contact information, and research procedures.
2. You are asked to sign this consent form and complete the Grade One Classroom Teacher Survey Form that may take 15 minutes to complete. Data will be kept confidential. Consent forms will be stored separately from the survey completed by participants. Identifying information will be removed and replaced with code numbers, so it is not possible to associate a name with any given set of responses. Arbitrary identification codes will be used that will not allow the identification of individual participant teachers or students. Therefore, researchers will only have access to anonymous information.
3. You have the right to refuse to answer individual questions.
4. You are asked to distribute a Parent/Guardian Information Letter for each of your Grade One students.
5. You are asked to complete and forward to Kathy Muttart at Division Office the Grade One Class Summary Profile Sheet after administering the Grade One Screening Tool available to you for assessment of your students. These raw

scores will serve as the data used in the statistical analyses on which the results and discussion of this study will be based. Data will be kept confidential. The researcher intends to begin data analysis by May 26, 2006.

6. You have the right to withdraw from this study at any time. If you choose to withdraw, the data you provided will be removed from analysis and destroyed. Withdrawal from this study will not result in any sort of penalty.
7. Your data will be stored in a locked cabinet accessible only by the researchers' supervisor, and safeguarded for at least five years. Information identifying participants will be destroyed.

If you have any questions concerning the study, please feel free to contact the researcher at the number provided. The University of Saskatchewan Behavioural Research Ethics Board (Beh-REB) has approved this study on ethical grounds on April 13, 2006. Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084). Participants interested in the results of the study will receive an executive summary upon request by contacting the researcher by phone or e-mail.

I have read and understood the description above. I have been provided with contact information to have any questions addressed. I consent to participate in the study described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been provided for my records.

Name of Participant (please print): _____

Signature: _____

Date: _____

Signature of Researcher: _____

Susan Protz
Masters Candidate, University of Saskatchewan

APPENDIX M

PARENT/GUARDIAN INFORMATION LETTER

PARENT/GUARDIAN INFORMATION LETTER

Title of Study:
The Impact of LiPS Instruction and Teacher Perception on Beginning Readers

Researcher and Supervisor:
Susan Protz, Master of Education candidate in the Department of Educational Psychology and Special Education at the University of Saskatchewan.
E-mail: sprotz@sasktel.net
Home Telephone: 497-2437

Dr. Laureen McIntyre, Assistant Professor, Department of Educational Psychology and Special Education, University of Saskatchewan.
E-mail: laureen.mcintyre@usask.ca
Office Telephone: 966-5266

Purpose of the Study:
Your first grade child's teacher has been invited to participate in a study. The purpose is to examine effective instructional strategies used by the teacher designed to help improve students' reading skills. The information may benefit classroom teachers to pinpoint instructional techniques that are beneficial to students who are learning to read. The results will be used for the researcher's thesis.

Your child will experience no changes to instruction and assessment procedures already delivered and/or available. The participation of your child's teacher requires her/him to assess your child's progress in some reading skills using a screening tool. This test gives teachers important information about children's progress in specific areas of reading. Your child's name will be replaced by a code so it is not possible to associate a name with any scores on the assessment. These scores will be analyzed and information will be shared to understand more about how best to teach children to read. You have the right to have your child withdrawn from this study at any time, by contacting your child's teacher. If you choose to withdraw him/her, that data will be removed from analysis and will not be included in the study. Withdrawal from this study will not impact his/her future participation in any service offered by school, nor will it affect his/her grades or progress. The data will be stored in a locked cabinet accessible only by the researchers' supervisor, and safeguarded for at least five years. Information identifying students and teachers will be destroyed.

If you have any questions concerning the study, please feel free to contact the researcher at the number provided. The University of Saskatchewan Behavioural Research Ethics Board (Beh-REB) has approved this study on April 13, 2006. Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084). Participants interested in the results of the study will receive an executive summary upon request by contacting the researcher by phone or e-mail.

Thank you for your cooperation in this study.

Respectfully yours,

Susan Protz, B. Ed.
Masters Candidate
Department of Educational Psychology and Special Education
University of Saskatchewan